CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

ORDER NO. 98-077 **NPDES PERMIT NO. CA0038024**

WASTE DISCHARGE REQUIREMENTS FOR:

FAIRFIELD-SUISUN SEWER DISTRICT
in FAIRFIELD, SOLANO COUNTY

The California Regional Water Quality Control Board, San Francisco Bay Region, hereinafter called the Board, finds that:

1. The Fairfield-Suisun Sewer District, hereinafter referred to as the discharger, applied to the Board for reissuance of its NPDES Permit for discharge of pollutants into State Waters.

FACILITY DESCRIPTION

2. The discharger owns the Fairfield-Suisun Subregional Wastewater Treatment Plant (the Plant), located at 1010 Chadbourne Road, Fairfield, Solano County, California. The Plant provides tertiary level treatment of wastewater from domestic, commercial and industrial sources within the City of Fairfield, City of Suisun City and, by contract, Travis Air Force Base. The discharger's service area has a present (1997) population of 111,300.

3. The U.S. Environmental Protection Agency (USEPA) and the Board have classified this discharger as a major discharger.

PURPOSE OF ORDER

4. This discharge is currently governed by Waste Discharge Requirements in Order No. 90-101. This NPDES Permit reissues/modifies the existing permit which regulates the discharge of treated wastewater to Boynton Slough, which is part of Suisun Marsh, and a tributary to Suisun Slough and Suisun Bay, waters of the State and the United States. By letter dated April 13, 1995, the Executive Officer administratively extended the permit until a new permit was reissued by the Board.

DISCHARGE DESCRIPTION

5. The Plant has an average dry weather flow design capacity of 17.5 million gallons per day (mgd), and a wet weather capacity of 40 mgd. The Plant presently treats an annual average flow of 16.0 mgd, with an average dry weather flow of 13.2 mgd (influent, 1996). Of the total flow treated, an annual average of 11.8 mgd was discharged during 1996, with 4.2 mgd reclaimed for agricultural irrigation, and an average dry weather flow of 9.2 mgd. Rapid development in Fairfield may have increased the potential for reclamation. Possible uses include landscape irrigation and dust control at construction sites. A special study on maximizing reclamation is included the Provisions. A map showing the location of the Plant is included as Attachment A.

6. Treated effluent is discharged to Boynton Slough (E-001) which is part of Suisun Marsh, and a tributary to Suisun Slough and Suisun Bay. Treated effluent is also discharged intermittently from the E-001 outfall pipeline

to privately owned and managed duck ponds in the Suisun Marsh (E-002 and E-003). The frequency and volume of these wastewater discharges are determined by the Solano Irrigation District and the Department of Fish and Game (depending on seasonal rainfall). These duck ponds are waters of the State and United States. These discharges to the ponds from the Plant are regulated by this Permit and Order.

7. Treated effluent is also reclaimed for agricultural irrigation via the discharger's Irrigation Reuse Outfall (E-004), which discharges into irrigation water conveyance and distribution facilities owned and operated by the Solano Irrigation District. This reclamation operation reduced the average dry weather flow discharge to Boynton Slough by about 45 percent (1991-1996). During peak summer months irrigation demand can exceed 50 percent of total Plant flow. The discharges of reclaimed water to land are regulated by a separate Order, Water Reclamation Requirements Order No. 91-147, adopted by the Board on October 16, 1991. A General Permit for water reuse in the San Francisco Bay Area, issued January 17, 1996, is also applicable to the reclamation project.

8. The names and locations of the Plant's discharge points are as follows:

Discharge Point Name	Code	Latitude	Longitude
Boynton Slough outfall	E-001	38° 12' 33"	122° 03' 24".
Duck Club Turnout No. 1	E-002	38° 12' 52"	122° 03' 56".
Duck Club Turnout No. 2	E-003	38° 12' 35"	122° 03' 29".
Irrigation Reuse outfall*	E-004	38° 13' 23"	122° 05' 00".

*Reclaimed water discharges to land only.

A map showing locations of the Plant and discharge points is included as part of this Order.

COLLECTION SYSTEM AND TREATMENT PROCESS DESCRIPTION

9. *Collection System and Pump Stations.* The discharger's wastewater collection system includes about 57 miles of major trunk sanitary sewer lines, and nine pump stations. Seven pump stations have on-site emergency power systems. For the other two stations, one has an auxiliary gravity flow line and the other has sufficient sewer line surcharge capacity (12 hours) to allow mobilization of portable generator systems. The discharger has an ongoing program for preventive maintenance and capital improvements for these sewer lines and pump stations in order to ensure adequate capacity and reliability of the collection system.

10. **Treatment Process and Effluent Flow Description.**

a. *Treatment Process.* The treatment process consists of comminution (3 units), grit removal (2 aerated chambers), primary sedimentation (4 rectangular basins), biological roughing filters (3 biooxidation towers), intermediate clarification (2 square clarifiers), biological treatment by a nitrifying activated sludge process (4 aeration basins), secondary clarification (4 square clarifiers), flow balancing by temporary storage in reservoirs (2 reservoirs, 12.7 million gallons (MG) total volume), tertiary treatment by filtration (8 dual-media filters with anthracite and sand) with chemical coagulation, disinfection by chlorination (2 contact tanks), and dechlorination using sulfur dioxide. Plant treated effluent flow is measured through a Parshall flume. The Plant is designed to

provide a 90% removal rate for ammonia nitrogen, and to meet all statewide requirements for reclaimed water of unrestricted reuse quality. A treatment process schematic diagram is included as part of this Order.

Due to the cost and health and safety concerns of using chlorine disinfection, the Baord will require the discharger to investigate the feasibility of alternative disinfectants in a special study in the Provisions.

b. *Effluent Flow Measurement.* Plant effluent flow is diverted either directly to the irrigation distribution system, to the final treated effluent holding reservoirs (3 reservoirs, 20.4 MG total volume), or to the outfall pipeline which extends about one mile to the Boynton Slough discharge point. Total Plant effluent flow (E-001-A) and flow to irrigation (E-004) are measured separately. A lesser amount of treated effluent, unmetered, can be diverted directly to irrigation from the outfall pipeline prior to the slough discharge point. Discharges to duck club waterfowl ponds (E-002 and E-003) are measured by the Solano Irrigation District. Discharge locations are shown on the attached map.

c. *Effluent Monitoring.* Currently, the effluent compliance monitoring point is at the chlorine contact chamber effluent (E-001A). Chlorinated final effluent (E-001-A) flows to either the Boynton Slough outfall or to a distribution box, where depending on recycled water irrigation demand, it flows to the irrigation distribution system or to the final effluent holding reservoirs. While stored in the reservoirs, the effluent may be subject to potential changes due to natural causes. The 20.4 MG earthen reservoirs are relatively shallow (8-10 feet) and retention times can range from a few hours to several weeks.

During periods of low irrigation demand and/or low (diurnal) Plant flow, stored water flows to the Boynton Slough outfall. The dechlorinated effluent discharged to Boynton Slough (E-001-S) is therefore a combination of chlorine contact basin effluent (E-001-A) and reservoir effluent. The actual percentage of this blend varies daily based on Plant effluent flow and irrigation demands. Thus, this Order specifies that flow, chlorine residual and pH be monitored continuously at E-001-S plus daily grab samples for dissolved oxygen and temperature. A special study is required in the Order's provisions to evaluate the impact of the reservoir releases on the treated effluent discharged from E-001-S.

11. **Wet Weather Flow Handling**

Treatment Plant and Collection System. The Plant has a wet weather treatment capacity of 40 mgd, and additional facilities for handling peak wet weather flows. These facilities include a 55 MG capacity earthen flow equalization basin and an equalization flow clarifier with comminution and prechlorination equipment During peak flows, influent can be diverted to and temporarily stored in the equalization basin and subsequently returned to the Plant for full treatment after Plant flows have subsided. The Plant and flow equalization facilities provide containment and tertiary treatment of all wastewater flows up to a 20-year recurrence interval storm event.

Wastewater collection systems are subject to increased flows during wet weather due to rainfall induced infiltration and inflow. The Basin Plan states that, depending on the level of water quality protection required, collection systems should be designed to contain different recurrence interval stormflows. Costs are significantly higher to size new portions of the collection system to accommodate a 20-year versus a 5-year storm. The

Provisions require the discharger to conduct a study to evaluate 20-year, 10-year and 5-year costs relative to the beneficial uses protected and to develop recommended collection system peak wet weather flow design criteria. The Executive Officer may review these recommendations and determine the appropriate level of protection to be provided to prevent controllable adverse impacts on beneficial uses.

12. **Solids Handling and Disposal**

a. *Solids Handling.* Solids removed from the wastewater stream are treated by dissolved air flotation thickening (2 units), anaerobic digestion (2 digesters), and then dewatering either by plate and frame filter press (2 units) or by open-air solar drying beds (10 acres total). Methane gas from the digesters is recovered, stored (1 spherical tank), and used to operate electrical generators (2 engines) for in-plant electrical needs.

b. *Solids Disposal.* Stabilized, dewatered biosolids are hauled away for off-site disposal. The primary point of disposal is the Potrero Hills Landfill, a permitted municipal solid waste landfill. Biosolids are also disposed through land application to agricultural land, in accordance with federal regulations. The land application of municipal wastewater biosolids is regulated by the USEPA under federal regulations found in 40 Code of Federal Regulations (CFR) 503 (Standards for the Use or Disposal of Sewage Sludge), published as a final rule on February 19, 1993. Annual biosolids production in 1995 was about 2,490 dry metric tons (dmt), with about 1900 dmt to landfill and 590 dmt to land application.

BASIS OF EFFLUENT LIMITS AND DISCHARGE REQUIREMENTS

13. *Basin Plan.* The Board adopted a revised Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) on June 21,1995. This updated and consolidated plan represents the Board's master waster quality control planning document. The revised Basin Plan was approved by the State Water Resources Control Board (SWRCB) and the Office of Administrative Law on July 20, 1995, and November 13, 1995, respectively. The Basin Plan identifies beneficial uses and water quality objectives for waters of the state in the Region, including surface waters and groundwaters. The Basin Plan also identifies effluent limitations and discharge prohibitions intended to protect beneficial uses. This Order implements the plans, policies and provisions of the Basin Plan.

14. *Beneficial Uses.* The beneficial uses identified in the Basin Plan for waters of Suisun Slough (SS), Suisun Bay (SB), and Suisun Marsh (SM) are:

Industrial Service Supply	(SB)
Navigation	(SB, SS)
Water Contact Recreation	(SB, SS, SM)
Non-contact Water Recreation	(SB, SS, SM)
Commercial and Sport Fishing	(SB)
Wildlife Habitat	(SB, SS, SM)
Preservation of Rare and Endangered Species	(SB, SM)
Fish Migration	(SB, SM)
Fish Spawning	(SB, SS, SM)

Estuarine Habitat	(SB, SM)
Warm Freshwater Habitat	(SS)

15. *Undesignated Beneficial Uses.* Boynton Slough is part of Suisun Marsh, and a tributary to Suisun Slough and thence Suisun Bay. The Basin Plan has not yet established beneficial uses specific for Boynton Slough. Board policy has been to use the tributary rule to interpret which beneficial uses are currently or potentially supported where beneficial uses have not been specifically designated. The discharger will participate in a receiving water study, as specified in the Provisions, which will in part investigate the appropriate beneficial uses for Boynton Slough. Any change in beneficial uses must be made in a Basin Plan amendment.

16. *Regulatory Basis of Effluent Limits.* Effluent limitations in this Permit are based on the plans, policies and water quality objectives and criteria of the Basin Plan, *Quality Criteria for Water* (EPA 440/5-86-001, 1986 and subsequent amendments, known as the "Gold Book"), applicable Federal Regulations (40 CFR Parts 122 and 131), National Toxics Rule (57 FR 60848, 22 December 1992; 40 CFR Part 131.36(b), referred to as the NTR), National Toxics Rule Amendment (Federal Register Vol. 60, No. 86, 4 May 1995 pg. 22229-22237), and Best Professional Judgment (BPJ) as defined in the Basin Plan.

U.S. EPA guidance documents upon which BPJ was developed may include in part:

Technical Support Document for Water Quality Based Toxics Control March 1991,

Region 9 Guidance For NPDES Permit Issuance February 1994,

Policy and Technical Guidance on Interpretation and Implementation of Aquatic Life Metals Criteria October 1, 1993,

Whole Effluent Toxicity (WET) Control Policy July 1994,

Draft National Guidance for the Permitting, Monitoring, and Enforcement of Water Quality-based Effluent Limitations set Below Analytical Detection/Quantitation Levels March 18, 1994,

National Policy Regarding Whole Effluent Toxicity Enforcement, August 14, 1995,

Clarifications Regarding Flexibility in 40 CFR Part 136 Whole Effluent Toxicity (WET) Test Methods, April 10, 1996,

Interim Guidance for Performance - Based Reductions of NPDES Permit Monitoring Frequencies, April 19, 1996,

Regions 9 & 10 Guidance for Implementing Whole Effluent Toxicity Programs Final May 31, 1996,

Draft Whole Effluent Toxicity (WET) Implementation Strategy February 19, 1997,

Proposed Rule for Water Quality standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California, August 5, 1997.

17. **Basis for Existing Limits**

a. *Alternative Limits.* at the time of issuance in 1990, it was not certain that the discharger could consistently comply with the new limits for lead, nickel, silver, and zinc. For cases where compliance with the new limits is not feasible, the Basin Plan included criteria under which a discharger could propose alternate effluent limits. The 1990 Order established a time schedule requiring the discharger to complete a study to evaluate alternative limits for the four metals, and to achieve compliance with the permit limits or alternate limits approved by the Board. In accordance with Provisions of the 1990 Order, the discharger conducted studies to assess receiving water quality, impacts of metals on beneficial uses, metal source identification, reasonable treatment and source control measures, treatment plant metals removal efficiencies, costs of additional measures to comply with the metals
limits relative to the level of beneficial uses protected by them, and control strategies for nonpoint sources contributory to the discharge receiving waters.

b. *Interim Limits.* The 1990 Order also contains interim performance based effluent limits for lead, nickel, silver, and zinc applicable during the compliance time schedule period. The interim limits were set at the 95th percentile of the prior five years effluent data. Measurements below the detection limit were considered equal to that detection limit. Exceedances were calculated to occur between 2 and 5 percent of the time. Primarily through aggressive implementation of source control and pollution prevention efforts and water purveyor corrosion control efforts, the discharger has attained full compliance with the 1990 Order's final limits.

18. **Basis for Revised Effluent Limits**

a. *Technology and Water Quality Based Limits.* Permit effluent limits for conventional pollutants are technology-based (tertiary treatment with filtration) and are the same as in the existing Permit. Toxic substances are regulated by water quality based effluent limitations (WQBEL) derived from USEPA national water quality objectives listed in the Basin Plan Table 3-4, the NTR, or the Gold Book. Limits for cadmium, cyanide, mercury, and PAHs are more stringent than in the existing permit. Further details about the effluent limitations are given in the associated Fact Sheet, which is incorporated in this Order.

b. *Freshwater Objectives and Limits.* The 1995 Basin Plan and 1992 NTR include formulas for calculating freshwater aquatic life objectives based on site specific hardness levels (the 1986 Basin Plan did not). The Basin Plan states that freshwater effluent limitations shall apply to discharges to receiving waters with salinities lower than 5 parts per thousand (ppt) at least 75 percent of the time in a normal water year. The receiving waters meet these criteria based on monitoring data from Boynton and Suisun Sloughs during the last two normal water years (1993 and 1996). The Basin Plan further states that for discharges to tidally-influenced fresh waters that support estuarine beneficial uses, effluent limitations shall be the lower of the marine, or freshwater effluent limitation based on ambient hardness. Boynton and Suisun Sloughs are tidally-influenced but are not listed in the Basin Plan as supporting estuarine beneficial uses. Beneficial uses have not yet been designated for Boynton Slough.

However, the downstream Suisun Slough is designated as warm freshwater habitat. This Order's Provisions require a study to investigate the beneficial uses of Boynton Slough.

c. *Ambient Salinity and Hardness*. Receiving water salinity and hardness varies with geographic location (increasing to the South), Delta outflow, and seasonal rainfall. Salinity values may be reduced further in upcoming years given continued work by the Department of Water Resources to reduce western Suisun Marsh salinities. Delta outflow decisions ("environmental releases") may also reduce salinities. Freshwater effluent limitations for applicable toxic constituents were evaluated using the formulas in Basin Plan Table 3-4 based on a conservatively derived ambient hardness of 200 mg/L as $CaCO_3$. Three year average receiving water hardness values ranged from 457 to 713 mg/L during 1993-1995.

d. *Suisun Bay Water Quality.* The draft Section 303(d) List of Impaired Water Bodies and Priorities for Development of Total Maximum Daily Loads for the San Francisco Bay Region, dated March 9, 1998, has been submitted to the State Board for adoption. Pollutants contributing to the impairment of Suisun Bay include mercury, copper, exotic species, diazinon, PCBs, selenium, and nickel.

The permit evaluated effluent limits based on the lower of the 1) Table 3-4 Basin Plan freshwater quality objectives or 2) the existing permit effluent limitations. Existing permit limitations are more stringent than the calculated freshwater quality objectives for arsenic, copper, lead, nickel, silver, zinc, and phenol.

19. **Shallow Water Discharge**

Boynton Slough. The discharge to Boynton Slough is into shallow water, with the outfall located at the shoreline of the Slough. The outfall is submerged under all conditions except possibly during extreme low tides at which times it is partially submerged. It is classified by the Board as a shallow water discharge, and effluent limitations are calculated assuming no dilution (D=0). The actual dilution received by the discharge has not been measured or modeled.

The Basin Plan, Shallow Water Discharges section (p. 4-12) specifies the issues that must be addressed to support requests for dilution credit. Shallow water dischargers may apply to the Regional Board for exceptions to the assigned dilution ratio of D=0 (and thus the shallow water effluent limitations) based on demonstration of compliance with water quality objectives in the receiving waters and implementation of an aggressive pretreatment and source control program. Based on special studies, the discharger may consider applying for limited dilution credit.

20. **Reasonable Potential Analysis**

The discharger submitted to the Board a reasonable potential analysis dated March 20, 1998 for each toxic constituent in its discharge which was detected during the period 1995 to 1997. The method used for these reasonable potential analyses was substantially based on EPA's Technical Support Document for Water Quality Based Toxics Control (March 1991). The toxic constituents analyzed were: arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, zinc, cyanide, PAs, and phenol. The results of the Reasonable Potential

Analysis are reflected in Section B: Effluent Limitations. Effluent limitations were included in this Order only if a reasonable potential exists to cause, or contribute to an excursion above any applicable narrative or numerical water quality objectives.

The discharger analyzed the potential of each constituent to exceed any of the applicable water quality objectives based on the lower of the 1) Table 3-4 Basin Plan freshwater quality objectives calculated at an ambient hardness of 200 mg/L or 2) the existing permit effluent limitations. The result of this screening analysis is that copper, lead, mercury, nickel, zinc, and cyanide are the only constituents found to have reasonable potential to exceed the applicable objectives (in Basin Plan Table 3-4 for mercury and cyanide and from Basin Plan Table 4-3 for copper, lead, nickel, and zinc).

There has been no detection of PAHs, for which the historical effluent limitations are lower than current analytical techniques can measure. The discharger will continue to monitor for these constituents and to investigate methodologies to improve detection limits. If detection limits improve to the point where it is feasible to evaluate compliance with the water quality goals, a new reasonable potential analysis would be conducted to determine whether there is a need to add effluent limits to the permit or to continue monitoring.

Based on the Reasonable Potential analysis, numeric limits are required to be included in the permit for copper, lead, mercury, nickel, zinc, and cyanide. All of the other toxic constituents with permit limits above the detection limit were found at levels well below the corresponding permit limitations. Based on continued consistent Plant performance none of these constituents show a reasonable potential to exceed the Existing Permit limitations. Under the federal Clean Water Act and the State Water Code, constituents of this nature are controlled by the requirement for secondary treatment.

For constituents that do not show a reasonable potential to exceed effluent limitations, i.e. arsenic, cadmium, chromium, selenium and silver, this Order requires continued monitoring and an annual evaluation. If significant increases in the occur in the concentrations of the constituents, the discharger will be required to investigate the source of the increases and establish remedial measures if the increases pose a threat to water quality.

A reopener provision is included in the permit that allows numeric limits to be added to the permit for any constituent that in the future exhibits reasonable potential to cause or contribute to an exceedance of a water quality standard. This determination will be made by the Board based on monitoring results.

21. **Copper**

a. *Plant Performance and Ambient Concentrations.* Influent copper concentrations averaged 59 µg/L in 1992, 55 µg/L in 1993, 46 µg/L in 1994, and 49 µg/L in 1995. In 1996, Plant influent copper concentrations ranged from 12 to 68 µg/L with an average of 40.2 µg/L. Reductions in copper influent leading to relatively low concentrations are due to source control and pollution prevention efforts and water supplier corrosion control. Effluent concentrations during 1995-1997 averaged 8.2 µg/L, with a range of 3.0 µg/L to 20 µg/L. Average removal rates are typically over 85 percent.

The regional monitoring program (RMP) during 1993-1995 found ambient total copper concentrations at Grizzly Bay to average 7.00 µg/L (3.28 - 11.54 µg/L range) while the more biologically significant dissolved concentrations averaged 2.17 µg/L (1.66 - 2.76 µg/L range). Honker Bay total copper concentrations averaged 5.10 µg/L (3.05 - 7.07 µg/L range) and dissolved concentrations averaged 2.06 µg/L (1.56 - 2.56 µg/L range). Both sites are in attainment with the proposed USEPA dissolved copper national objective of 3.1 µg/L. Significant sources of copper around the Bay include storm water, brake pads, and riverine inputs. POTWs are estimated to contribute less than 10 percent of the total copper loading.

b. *Site Specific Copper Objective.* In 1984, the USEPA promulgated a national saltwater and freshwater copper objective of 2.9 µg/L. The Board developed a bay-wide site-specific water quality objective for copper for San Francisco Bay of 4.9 µg/L in 1991. The site specific objective for copper employed the "water effect ratio" approach developed by the USEPA. This approach provides a measure of the binding capacity of natural waters (dependent on particulate matter) relative to the binding capacity of reference waters (filtered oceanic water).

The Basin Plan was amended on October 21, 1992, to include the site specific water quality objective of 4.9 µg/L copper for San Francisco Bay and again on June 16, 1993, to incorporate a wasteload allocation for copper. On April 21, 1994, the SWRCB remanded these Basin Plan amendments as a consequence of the court decision which invalidated the California Enclosed Bays and Estuaries Plan and Inland Surface Waters Plan (State Plans).

In the best professional judgment of Board staff, from a technical standpoint, the Bay-wide site-specific objective is protective of the most sensitive designated beneficial use of San Francisco Bay water with respect to copper: habitat for aquatic organisms. The study and associated staff analysis are described in a September 25,1992, Board staff report entitled "Revised Report on Proposed Amendment to Establish a Site Specific Objective for Copper for San Francisco Bay." The staff report states that the copper objective is best applied where bay "background" waters provide dilution, which may, or may not, include slough sites. The report also noted that developing separate objectives for sloughs might be desirable from the standpoint of refining our ability to assess risk. However, at that time the scientific tools (brackish species protocols) for such an effort were not available.

c. *Permit Copper Limit.* The calculated freshwater quality objective at 200 mg/L hardness is 21.4 µg/L, which is greater than the existing Permit and Basin Plan effluent limit of 20 µg/L. This Permit retains the 20 µg/L limit based on antibacksliding compliance. While performance based effluent limitations may be either concentration or mass based, and mass based limits may be more appropriate for copper and mercury, insufficient information currently exists to develop technically defensible mass based limits. The discharger will investigate additional potential copper source control and corrosion control measures as cited in the provisions.

22. **Mercury**

a. *Mercury Water Quality Objectives.* For mercury, the national chronic criterion is based on the protection of human health. The criterion is intended to limit the bioaccumulation of methyl-mercury in fish and shellfish to levels which are safe for human consumption. As described in the Gold Book, the freshwater objective is based on the Final Residual Value of 0.012 µg/L was derived from the bioconcentration factor of 81,700 for methylmercury with the fathead minnow, and which assumes that essentially all discharged mercury is

methylmercury. The saltwater objective of 0.025 µg/L was similarly derived using the bioconcentration factor of 40,000 obtained for methylmercury with the Eastern oyster.

b. *Ambient Concentrations and Attainment.* Regional monitoring program (RMP) ambient data from 1993-1995 for total mercury averaged 0.022 µg/L (0.009 - 0.041 µg/L) in Grizzly Bay (the closest station to Suisun Slough), and averaged 0.013 µg/L (0.006 - 0.026 µg/L) in Honker Bay. Dissolved mercury concentrations averaged 0.0019 and 0.0016 µg/L, respectively. Mercury data are not available for Suisun or Boynton Sloughs to determine whether the freshwater objective is being attained. Based on total mercury concentrations and the marine objective being applicable when ambient salinity exceeds 5 ppt, Grizzly Bay was not in attainment with the applicable mercury objective on 5 out of the 9 RMP sampling dates. The exceedances generally corresponded with water column suspended solids concentrations over 100 mg/L.

c. *Mercury Sources.* Major sources of mercury to San Francisco Bay include riverine inputs and storm water runoff. Atmospheric deposition is not well quantified but is believed to be a major source. Studies conducted by the Santa Clara Valley Non Point Source Pollution Control Program (Metals Control Measures Report - January 1997) found point sources to contribute three percent of the measured mercury loading to the Bay and diesel fuel combustion from tailpipes to contribute 33 percent. Abandoned mines such as in the Cache Creek watershed have also been found to be significant sources. Sources of mercury from municipal treatment plants are estimated to range from 15-35 percent.

The discharger has attempted to locate significant controllable sources of mercury within its service area. To date, these efforts tend to confirm the information gathered in studies of residential wastewater sources - most mercury found at the Plant headworks comes from residential sources. Sampling of local hospitals and dental offices has not revealed significant sources of mercury beyond background levels. The average concentration from collection system sampling from residential areas in the discharger's service area is 0.4 µg/L. The six year average Plant influent concentration is 0.2 µg/L. Through its pollution prevention program and storm water program, the discharger continues to conduct public education and outreach programs aimed at reducing the discharge of pollutants to its sewer system from residential sources.

d. *Treatment Plant Performance and Attainability.* Effluent concentrations during 1995-1997 averaged 0.026 µg/L, with a range of 0.01 µg/L (detection limit) to 0.20 µg/L, in consistent compliance with the existing Permit limit of 1 µg/L. Average mercury removal efficiency from the Plant is about 85 percent. These data indicate that the discharger did not routinely achieve the 0.012 µg/l national freshwater objective and intermittently exceeded the 0.025 µg/L marine objective.

e. *Interim and Final Limits.* An interim monthly average of 0.092 µg/L is included in the permit based on 1995-1997 Plant performance and BPJ. The monthly average limit is based upon recent (1995-1997) plant performance at the 99.7 percentile level and is solely for the purposes of this Permit and only for the duration of the Permit.

The Basin Plan (at p. 4-8) provides that alternate effluent limitations can be considered by the Board where a site-specific water quality objective is being proposed and the discharger is participating in source control

programs. The discharger is implementing well-developed source control programs for mercury and committing to participate in the Board's mercury source identification and control measures. It is consistent with this provision of the Basin Plan to use an interim effluent limitation for mercury pending the development of the studies leading up to the Board's consideration of any site-specific recommendations to evolve from those analyses. The Board intends to include a final WQBEL in a subsequent permit revision after additional information on such factors as attainability, impacts on beneficial uses, and site specific limits is developed. If this Permit is not revised with a final WQBEL for mercury according to the time schedule in Provision 3, then an effluent limit of 0.012 µg/L shall be established.

f. *Special Studies and Schedules.* Board staff are in the process of developing a plan to address mercury compliance for the six North Bay shallow water dischargers, including the discharger. Until about three years ago, the analytical detection limit for mercury commercially available was not low enough to determine compliance with the fresh (in particular) and marine water quality objectives. Review of data collected since that time indicates that the discharge concentrations are all generally higher than the objectives. This Order encourages the discharger to work with the other shallow water dischargers to optimize both source control efforts and assessment of alternatives for achieving compliance.

The Board intends to work towards an overall reduction of mercury mass loadings in the watershed. This Permit's Provisions contain a time schedule and reopener clause according to which the discharger will participate in studies being directed by the Board, and in other watershed based activities, aimed at mercury source identification and reduction. Prior to expiration of this Permit, the Board may reconsider this Permit and either incorporate an alternate mercury limit if adequate information has been developed to support such a limit, or extend the Permit with a potentially more stringent interim limit and require the discharger to continue developing (or participating in the development of) the additional needed information to support a technically defensible limit that is protective of aquatic life and human health.

23. For pollutants that have performance-based limits based on the reasons stated above, the Board intends to establish final water-quality-based-limits after intensive literature review and data collection to determine appropriate local water quality objectives and cost-effective measures to achieve these objectives. Based on the final Water Quality-Limited Waterbodies (303(d)) list, the Board may adopt Total Maximum Daily Loads (TMDLs) which may result in revising the water-quality-based-limits. The Board's plan for conducting these reviews, data collection and potentially developing TMDLs will be prioritized in the final 303(d) list and incorporated into the Watershed Management Initiative for implementation.

The following summarizes the Board's strategy to collect water quality data and general approaches to policy and TMDL development with associated time frames, and funding mechanism for this work:

1. Data collection - The Board will require individual point and non-point discharger or dischargers collectively to develop analytical techniques capable of detecting these pollutants at levels of concern and to characterize loadings from their facilities into the water quality-limited waterbodies. The results will be used to (1) revise the 303(d) list and (2) support the watershed-specific pollutant policy development.

2. Policy and TMDL development - A draft region-wide Mercury TMDL has been prepared by the Board staff which will be distributed for public review and comment in 1998. Adoption of the Mercury TMDL will be considered by the Board as part of the Basin Plan triennial review in 1998. This process will refine the timing and mechanism for development of other pollutant-specific TMDLs.

3. Funding mechanism - The Board anticipates receiving resources from federal agencies for development of any alternate water quality based limits. The Board intends to supplement these resources to ensure timely alternate limits by allocating development costs among all dischargers through Regional Monitoring Program (RMP) or other appropriate group funded mechanisms. The discharger has shown a willingness to participate in such a Board-initiated group effort as long as criteria are established to allocate the costs among all dischargers in the watershed equitably.

24. *Cyanide*. Effluent cyanide concentrations during 1995-1997 averaged 7.9 µg/L, with a range from <3 µg/L to 20 µg/L. This Permit contains a performance based limit of 17.5 µg/L derived from the 99.7 percentile of 1995-1997 Plant performance solely for the purposes of this Permit and for the duration of the Permit. While influent cyanide concentrations are generally below detection limits, effluent chlorination appears to be creating cyanide or compounds that are also detectable by cyanide analyses (positive interferences). A final WQBEL is not being incorporated into the permit at this time. The Board intends to include a final in a subsequent permit revision after additional information on such factors as attainability, impacts on beneficial uses, and site specific limits is developed. The discharger will investigate potential analytical interferences, in-plant sources of cyanide and potential reduction measures as cited in the Provisions.

25. *Total and Fecal Coliform*. The Basin Plan specifies water quality objectives for both total and fecal coliform. To date, the effluent limitation for coliform has been based on total coliform. The Basin Plan allows the Board to substitute fecal coliform limitations for total coliform limitations provided that it can be conclusively demonstrated through a program approved by the Board that such substitution will not result in unacceptable adverse impacts on the receiving water. The Board can also consider establishing less stringent discharges during wet weather. The most restrictive beneficial use in Suisun Slough is body contact recreation, for which the fecal coliform water quality objective is a log mean of 200 Most Probable Number (MPN)/100 mL and a 90th percentile of 400 MPN/100 mL. Operating under a fecal coliform standard of disinfection control would reduce chlorinated hydrocarbons (disinfection byproducts) discharged to the Bay. Chlorination and dechlorination costs, and associated transport, handling, and storage risks are also reduced.

This Permit authorizes the discharger to demonstrate bacteriological compliance with either the specified total or fecal coliform limits, after the discharger has established to the satisfaction of the Board that the use of fecal coliform limits will not impair the identified beneficial uses in the vicinity of the outfall. The discharger will conduct this investigation in accordance with the beneficial uses workplan to be submitted for prior Executive Officer approval as specified in the provisions.

26. *Acute Toxicity*. USEPA promulgated updated acute and chronic toxicity test methods on October 16, 1995, in 40 CFR Part 136. Dischargers have identified several practical and technical issues that need to be resolved

before implementing the new procedures. The primary issue is that the use of younger, possibly more sensitive, fish, may necessitate a reevaluation of permit limits. Acute testing of very young larval fish begins to approximate a chronic toxicity test. SWRCB staff recommended to the regional boards that new or renewed permit holders be allowed a time period in which new laboratories can become proficient in conducting the new tests. A provision is included in the Monitoring Program allowing the discharger to continue using the current test protocols until further guidance is provided by SWRCB or Board staff on conducting the new tests and interpreting the compliance results compared to current test results.

27. **Chronic Toxicity**

a. *Program history*. The Basin Plan contains a narrative toxicity objective that "All waters shall be maintained free of toxic substances in concentrations that are lethal to or produce other detrimental responses to aquatic organisms" and that "there shall be no chronic toxicity in ambient waters." The Board initiated the Effluent Toxicity Characterization Program (ETCP) in 1986 with the goal of developing and implementing toxicity limits for each discharger based on actual characteristics of both receiving waters and waste stream. Two rounds of effluent characterization were conducted by selected dischargers beginning in 1988 and in 1991. A second round was completed in 1995, and the Board is evaluating the need for a third round. Board guidelines for conducting toxicity tests and analyzing results were published in 1988 and last updated in 1991.

The Board adopted Order No. 92-104 in August 1992 which amended the permits of eight dischargers to include numeric chronic toxicity limits. Shallow water dischargers, including the discharger, were assigned limits of an eleven sample median value of 1 TUc and 90th percentile value of 2 TUc. The Order was appealed to the SWRCB by three South Bay dischargers. By letter dated November 8, 1993, the SWRCB informed the petitioners that, "Because Order No. 92-104 was based largely on the Plan, the Regional Board will have to reconsider the order if the Plan is invalidated." (which it subsequently was) The letter also committed to providing the regional boards with guidance on issuing permits in the absence of the State Plans (*Guidance for NPDES Permit Issuance,* February 1994).

b. *SWRCB Toxicity Task Force Recommendations*. The Toxicity Task Force provided several consensus based recommendations in their October 1995 report to the SWRCB for consideration in redrafting of the State Plans. A key recommendation was that permits should include narrative rather than numeric limits, with numeric test values used as toxicity "triggers" to first accelerate monitoring, then to initiate Toxicity Reduction Evaluations (TREs).

c. *Regional Board Program Update and BPJ*. The Board intends to reconsider Order No. 92-104 as directed by the SWRCB, and to update, as appropriate, the Board's Whole Effluent Toxicity (chronic and acute) program guidance and requirements. This will be done based on analysis of discharger routine monitoring and ETCP results, and in accord with current USEPA and SWRCB guidance. In the interim, decisions regarding the need for and scope of chronic toxicity requirements for individual dischargers will continue to be made based on BPJ as indicated in the Basin Plan.

d. *Discharger Monitoring Results.* The discharger participated in the first round ETCP screening and variability testing in 1989-1990. During the course of ETCP monitoring, the discharger did not detect a significant or consistent pattern of chronic toxicity. One of the five test species, *Selenastrum capricornutum* (a freshwater algae, not indigenous to the Suisun Marsh) was found to be sensitive to the effluent. During Variability Phase testing, some apparent chronic toxicity with this species was observed, possibly related to elevated conductivity and/or hardness in the effluent, a potential problem encountered by other dischargers and also reported by EPA. Subsequent monthly monitoring with *Selenastrum* during 1993-1994 showed no detectable toxicity (<1 TUc) in ten of the twelve tests conducted. The two incidents with apparent toxicity may have been due to laboratory quality assurance limitations with those tests. Follow-up monitoring did not detect any effects after either case.

e. *Permit Requirements.* The Regional Monitoring Program (RMP) has not detected any consistent ambient receiving water toxicity during routine three per year tests at multiple sites around the Bay from 1993 through 1995. Reported incidents have been episodic, and may have been related to high Delta outflows and/or agricultural runoff carrying organophosphate pesticides to which the bioassay organisms are highly sensitive. During February 1996, toxicity was observed at San Joaquin, Sacramento River, and the Grizzly Bay monitoring stations. Given the absence of widespread toxicity, the RMP has proposed to alter its toxicity monitoring to focus on episodic events. The discharger's 1987 receiving water study found no evidence of toxicity, attributable to the discharger, to the ambient phytoplankton population, no adverse impairment of beneficial uses, and concluded that the discharger provided a net environmental benefit. Ambient toxicity will be re-evaluated as part of the receiving water beneficial use studies to be conducted per the Provisions.

Based on the absence of evidence of ambient toxicity, the limited evidence of detectable chronic toxicity in recent monitoring data, its reliable wastewater treatment operation, and its continued implementation of an aggressive source control and pollution control program and storm water quality management program, the discharger reported that its discharge is unlikely to cause or contribute to an exceedance on ambient toxicity. In accordance with EPA and SWRCB Task Force guidance, and based on BPJ, the Permit includes the Basin Plan narrative toxicity objective as the limit, implemented via monitoring with accelerated monitoring and TRE triggers.

f. *Permit Reopener.* The Board will consider amending the Permit to include numeric toxicity limits if the discharger fails to aggressively implement all reasonable control measures included in its approved TRE workplan, following detection of consistent significant non-artifactual toxicity.

28. *Mass Emission Limit for Mercury.* Due to impairment of Suisun Bay and bioaccumulation effects, a mass emission limit for mercury is included in the Order, as specified in the Provisions. The purposes of the mass emission limit are to maintain the status quo in the receiving waters without further contributing to existing impairments and to encourage reclamation.

BASIN PLAN DISCHARGE PROHIBITIONS AND EXCEPTIONS

29. Discharge to Boynton Slough is contrary to two of the Discharge Prohibitions identified in the Basin Plan. The Basin Plan states, in part:

"It shall be prohibited to discharge:

1. Any wastewater which has particular characteristics of concern to beneficial uses at any point at which the wastewater does not receive a minimum initial dilution of at least 10:1, or into any nontidal water, dead-end slough, similar confined waters, or any tributary thereof.

...

3. Any wastewater which has particular characteristics of concern to beneficial uses to Suisun Marsh during the dry weather period of the year."

30. The Basin Plan states that exceptions to the above prohibitions will be considered for discharges where:

"a. An inordinate burden would be placed on the discharger relative to the beneficial uses protected and an equivalent level of environmental protection can be achieved by alternate means, such as an alternative discharge site, a higher level of treatment, and/or improved treatment reliability; or
b. A discharge is approved as part of a reclamation project; or
c. It can be demonstrated that net environmental benefits will be derived as a result of the discharge."

31. The Basin Plan further states that:

"Significant factors to be considered by the Regional Board in reviewing requests for exceptions will be the reliability of the discharger's system in preventing inadequately treated wastewater from being discharged to the receiving water and the environmental consequences of such discharges."

32. In 1985, as part of NPDES Permit reissuance Order No. 85-53, the Board granted an exception to the prohibitions stated above, provided that the discharge affords a net environmental benefit and the discharger complies with the requirements of its Permit. The requirements of that Permit included: maximize reclaimed water use for irrigation; prepare emergency wastewater storage; complete technical reports on maximizing reclaimed water use and discharge impacts on beneficial uses, and implement report recommendations.

33. In 1990, as part of NPDES Permit reissuance Order No. 90-101, the Board found that the discharger had achieved compliance with the requirements of Order No. 85-53, as described below:

a. Effluent discharged for reclamation through the Solano Irrigation District distribution system increased from 22%, in 1985, to 40%, in 1989, of the Plant's annual average effluent flow.

b. In 1987 the discharger completed construction of flow equalization and storage facilities which included the required renovation of existing basins for emergency storage, as well as addition of a flow equalization clarifier and use of two existing on-site lagoons for additional storage capacity. These facilities provide storage capacity of 12.6 MG, and can be used for storage of peak wet weather flows, or for emergency storage in the event of a Plant upset.

c. In 1987 the discharger completed the required technical report about the effects of the discharge on water quality and protection of beneficial uses (Technical Report on Water Quality, Fairfield-Suisun Sewer District Subregioinal Wastewater Treatment plant, September 1987). The report evaluated existing water quality data to determine the discharge's impacts on Boynton Slough, and the degree of environmental benefit, if any, from the effluent discharge. The report demonstrated that the discharge has some measurable local effects on Boynton Slough, but that these effects do not significantly impair any beneficial uses. Those beneficial uses related to the input of fresh water were found to be more fully achieved as a result of the effluent discharge. The report concluded that overall, on a year-round basis, the discharge affords a net environmental benefit to Boynton Slough and the Suisun Marsh, and that no need to modify existing wastewater management practices was indicated. For rationale, see the Findings of the Tentative Order.

34. In 1992, construction was completed on additional facilities to provide increased storage capacity for peak wet weather flows and to provide improved flexibility and redundancy in the treatment process. These facilities, identified by the discharger as the Stage IA project, include a 55 MG capacity earthen equalization basin, an equalization flow clarifier with comminution and prechlorination equipment, and a third oxidation tower. The project increased flow equalization storage capacity from 12.6 MG to 55 MG and provided containment and treatment of all wastewater flows up to a twenty-year recurrence interval storm event. This approach to wet weather flow management is in accord with the Basin Plan's wet weather overflow control strategy. The third oxidation tower provides increased redundancy in the treatment process and allows for servicing of any one tower, without reducing treatment performance or reliability.

35. Given the above considerations, exceptions to the Discharge Prohibitions described in the findings. above are warranted for the discharges of tertiary treated effluent to Boynton Slough and to the managed duck ponds of Suisun Marsh, provided the discharger continues to:

a. Provide high quality treated effluent;
b. Operate all treatment facilities to assure high reliability and redundancy;
c. Provide treated effluent to the managed waterfowl ponds of Suisun Marsh; and
d. Work to use the maximum feasible amount of reclaimed effluent for irrigation, and minimize discharges to Boynton Slough during dry weather.

OTHER DISCHARGE CHARACTERISTICS AND PERMIT CONDITIONS

36. **Treatment Plant Storm Water Discharges**

a. *Federal Regulations.* Federal Regulations for storm water discharges were promulgated by the USEPA on November 19, 1990. The regulations (40 CFR Parts *122,* 123, and 124) require specific categories of industrial activity (industrial storm water) to obtain a NPDES permit and to implement Best Available Technology Economically Achievable (BAT) and Best Conventional Pollutant Control Technology (BCT) to control pollutants in industrial storm water discharges.

b. Coverage under Statewide Storm Water General Permit. The State Board adopted a statewide NPDES permit for storm water discharges associated with industrial activities (NPDES General Permit CAS000001, adopted November 19,1991, amended September 17,1992, and reissued April 17, 1997). The general permit is applicable to municipal wastewater treatment facilities. The discharger has obtained coverage under the general permit (effective October 23, 1992, as facility ID number 2 48S001983), for storm water discharges from the discharger's Plant.

37. *Fairfield Suisun Urban Runoff Management Program.* The discharger holds a municipal storm water NPDES permit (Board Order No. 95-079) for the area within Fairfield (except Travis Air Force Base) and Suisun City boundaries. As such, the discharger has true "watershed" responsibility and authority for its service area. The joint responsibilities (wastewater and storm water) provide significant watershed water quality control opportunities. These include: quick resolution of issues associated with non-storm water discharges to sanitary sewers; common pollution prevention themes and solutions; joint, broad based business inspection programs; and shared program goals and objectives.

In addition, the discharger's storm water program strives to reduce the discharge of pollutants to the northern Suisun Marsh through implementation of best management practices, public education, enforcement, and a new development pollution prevention program.

38. *Source Control and Pollution Prevention Programs.* The discharger has implemented and is maintaining an effective USEPA approved pretreatment program in accordance with Federal pretreatment regulations (40 CFR Part 403) and this Board's blanket Order No. 95-015. As part of its source control program, the discharger also conducts a pollution prevention program in accordance with Basin Plan requirements and in coordination with its storm water program.

39. O&M *Manual.* An Operations and Maintenance Manual is maintained by the discharger for purposes of providing Plant and regulatory personnel with a source of information describing all equipment, recommended operation strategies, process control monitoring, and maintenance activities.

40. *CEQA.* This Order serves as an NPDES Permit, reissuance of which is exempt from the provisions of Chapter 3 (commencing with Section 21100) of Division 13 of the Public Resources Code (California Environmental Quality Act) pursuant to Section 13389 of the California Code.

41. *Public Notice.* The discharger and interested agencies and persons have been notified of the Boa. intent to reissue requirements for the existing discharge and have been provided an opportunity to submit thei .itten views and recommendations.

42. *Public Hearing.* The Board, in a public meeting, heard and considered all comments pertaining to the discharge.

IT IS HEREBY ORDERED, pursuant to the provisions of Division 7 of the California Water Code and regulations adopted thereunder, and to the provisions of the Clean Water Act and regulations and guidelines adopted thereunder, that the discharger shall comply with the following:

A. DISCHARGE PROHIBITIONS

1. Discharge of treated wastewater at a location or in a manner different from that described in the findings of this Order is prohibited.

2. a. Discharge of treated wastewater at any point where it does not receive a minimum initial dilution of 10:1, or into dead-end sloughs and similar confined waters, is prohibited, except as defined in prohibition 2.b. below.

b. Based on the findings, exceptions to this prohibition and the prohibition against discharge to Suisun Marsh during dry weather are granted, for the discharges described in the findings of this Order. These exceptions are conditional upon continued compliance with the requirements of this Order, and in particular the conditions specified in the provisions of this Order.

3. The bypass or overflow of untreated or partially treated wastewater to waters of the State, either at the Plant or from the collection system or pump stations tributary to the Plant, is prohibited.

4. The discharge of average dry weather flows greater than 17.5 mgd is prohibited. The average dry weather flow shall be determined over three consecutive dry weather months each year.

5. Discharges of water, materials, or wastes other than storm water, which are not otherwise authorized by an NPDES permit, to a storm drain system or waters of the State are prohibited.

B. EFFLUENT LIMITATIONS

The term "effluent" in the following limitations means the treated wastewater effluent from the Plant, as discharged to receiving waters. Compliance for the effluent limits specified in Sections B.4, B.5, B.7 and B.8 shall be monitored at Station E-001-S.

1. **Conventional Pollutants** The effluent limits shall not exceed the following limits:

Constituent	Unit	Monthly Average	Weekly Average	Daily Maximum	Instantaneous Maximum
a. Biochemical Oxygen Demand (BOD_5, 20°C)	mg/L	10	15	20	
b. Total Suspended Solids(TSS)	mg/L	10	15	20	
c. Settleable Matter	mL/L-hr	0.1			0.2
d. Oil & Grease	mg/L			10	
e. Ammonia Nitrogen	mg/L	2.0	3.0	4.0	

f. Turbidity	NTU	10

2. **85 Percent Removal - BOD_5 and TSS**

The arithmetic mean of the BOD_5 and TSS values, by weight, for effluent samples collected in each calendar month shall not exceed 15 percent of the arithmetic mean of the respective values, by weight, for influent samples collected at approximately the same times during the same period.

3. **Coliform Bacteria**

The treated wastewater, at some point in the treatment process prior to discharge, shall meet the following limits of bacteriological quality:

a. The moving median value for the MPN of total coliform bacteria in any seven consecutive samples shall not exceed 2.2 MPN/100 mL; and

b. Any single sample shall not exceed 23 MPN/100 mL.

The discharger may use alternate limits of bacteriological quality instead of meeting 3.a and 3.b above (total coliform limits) during the study in Provision 6 to determine appropriate limits if the discharger can establish to the satisfaction of the Board that the use of the fecal coliform limits will not result in unacceptable adverse impacts on the beneficial uses of the receiving water.

4. **pH**:

The pH of the effluent shall not exceed 8.5 nor be less than 6.5.

5. **Chlorine Residual**

The effluent shall not contain a residual chlorine concentration greater than 0.0 mg/L at any time. This concentration limit is defined as below the limit of detection in standard test methods.

6. **Toxic Substance Effluent Limitations**

The effluent discharged shall not exceed the following limits. (All limits are in units of µg/L, unless otherwise specified) (a)(b):

Constituent	Daily Average (c)	Monthly Average (c)
Copper (d,h,i)	20	
Lead (h,i)	5.6	
Mercury (e,i,j)		0.012

Mercury, Mass Emission Limit (k)		0.060 kg/month
Nickel (f,h,i)	7.1	
Zinc (f,h,i)	58	

Interim Effluent Limits

Mercury	0.092
Cyanide (g)	17.5

(a) Compliance with these limits is intended to be achieved through secondary treatment and, as necessary, pretreatment and source control.

(b) All analyses shall be performed using current USEPA methods, as specified in "Test Methods for Evaluating Solid Wastes Physical/Chemical Methods", SW-846, Third Edition, or equivalent reference approved in writing by the Executive Officer. Method Detection Limits, Practical Quantitation Limits, and quantitative levels will be taken into account in determining compliance with effluent limitations.

(c) Limits apply to the average concentration of all samples collected during the averaging period (i.e., Daily = 24-hour period; Monthly = calendar month). Compliance determinations shall be based on available analyses for the time interval associated with the effluent limitation. When only one sample analysis is available in a specified time interval (e.g., monthly average), that sample shall serve to characterize the discharge for the entire period.
(d) A corrosion control, source control, and Plant optimization study shall be performed to evaluate the feasibility of further reducing copper loadings to and from the treatment plant according to the tasks and schedule identified in the provisions of this Order.

(e) An interim permit limitation of 0.092 µg/L as a monthly average is justified pending the development of adequate data upon which a final limitation may be based. The limit is based upon recent (1995-1997) Plant performance at the 99.7 percentile level and is solely for the purposes of this permit and for the duration of this permit. This limit is in effect pending completion of a North Bay watershed-based mercury source identification and control study to be completed according to the tasks and schedule identified in the provisions of this Order. If a WQBEL based on site-specific information is not established according to the time schedule specified in the Provision 3, then the effluent limit shall be 0.012 µg/L.

(f) Effluent limitation may be met as a four-day average. If compliance is to be determined based on a four-day average, then four separate 24-hour composite samples shall be obtained over four consecutive days, and the concentration results for each composite sample shall be reported, as well as the average of the four.

(g) An interim permit limitation is justified pending the development of adequate data upon which a final limitation may be based. The limit is based upon recent (1995-1997) plant performance at the 99.7 percentile level and is solely for the purposes of this permit and for the duration of this permit. Compliance may be

demonstrated by measurement of weak acid dissociable cyanide. A study shall be performed examining cyanide generation within the treatment process per Provision 5 following which the Board may assess revising the limit.

(h) Basin Plan Table 4-3: Shallow Water Effluent Limits, Existing Permit Limit. Limit less than fresh water quality based effluent limit calculated at ambient hardness of 200 mg/L.

(i) Metal limits are expressed as total recoverable metals.

(k) Compliance with the mass emission limit shall be based upon calculations in Provision 17. The mass-based limit is calculated based on 12-month moving average of flows and concentrations based on 1995 to June 1998 data. The discharger shall demonstrate compliance with the mass-based limit using the discharge flow after diversion for reclamation. This is an interim limit and will be superseded upon completion of a Total Maximum Daily Load and Waste Load Allocation process. According to the antibacksliding rule in Clean Water Act Section 402(o), the permit may be modified to include a less stringent requirement following completion of a TMDL and Waste Load Allocation, if the bases for an exception to the rule are met. Enforcement action by the Board of any exceedences of the mass emission limit shall take into account extreme wet weather conditions.

7. **Whole Effluent Acute Toxicity**

Representative samples of the treated effluent shall meet the following limits for acute toxicity:

a. an eleven sample median value of not less than 90 percent survival(1); and
b. an eleven sample 90th percentile value of not less than 70 percent survival(2).

(1) If five or more of the past ten or fewer samples show less than 90 percent survival, then survival of less than 90 percent on the next sample represents a violation of the effluent limit.

(2) If one or more of the past ten or fewer samples show less than 70 percent survival, then survival of less than 70 percent on the next sample represents a violation of the effluent limitation.

8. **Whole Effluent Chronic Toxicity**

Compliance with the Basin Plan narrative toxicity objective shall be demonstrated according to the following tiered requirements based on results from representative samples of the treated effluent meeting test acceptability criteria and Provisions 15 and 16.

a) routine monitoring;
b) accelerate monitoring after exceeding a three sample median value of 1 TUc(1) or a single sample maximum of 2 TUc;
c) return to routine monitoring if accelerated monitoring does not exceed either "trigger" in "b";
d) initiate approved TRE workplan and continue accelerated monitoring if monitoring confirms consistent toxicity above either "trigger" in "b";

e) return to routine monitoring after appropriate elements of TRE workplan are implemented and toxicity drops below "trigger" levels in "b", or as directed by the Executive Officer.

(1) A TUc equals 100 divided by the no observable effect level (NOEL). The NOEL is determined from IC, EC, or NOEC values. These terms, their usage, and other chronic toxicity monitoring program requirements are defined in more detail in the Self-Monitoring Program of this Order. Monitoring and TRE requirements may be modified by the Executive Officer in response to the degree of toxicity detected in the effluent or in ambient waters related to the discharge.

9. Until a final water quality-based effluent limit based on TMDL/WLA for mercury is established, the discharger shall demonstrate that the current mercury mass loading to the receiving water does not increase. If monthly mass loading for mercury exceeds the following trigger level, actions specified in Provision 18 shall be initiated.

Mercury load trigger = 0.047 kg/month [a]

[a] This load was calculated based on yearly moving averages of discharge flows and mercury concentrations from only "ultra-clean" analysis from 1995 through May 1998. The load will act as a trigger to initiate certain actions as specified in the Provisions. This loading "trigger" will be superseded upon completion of Total Maximum Daily Load and Waste Load Allocation. According to the antibacksliding rule in the Clean Water Act, Section 402(o), the permit may be modified to include a less stringent requirement following completion of a TMDL and waste load allocation, if the bases for an exception to the rule are met.

The mass emission loading for mercury shall be calculated as follows in lieu of G.12 and 13 in the Standard Provision and Reporting Requirments:

Flow = Running average of last 12 months of effluent flow in mgd, measured at E-001-S

Hg Conc = Running average of last 12 monthly mercury concentration measurements in µg/L, measured at E-001-A

Mass emission loading, in kg/month = Flow x Hg Conc x 0.1151

C. RECEIVING WATER LIMITATIONS

1. The discharge of waste shall not cause the following conditions to exist in waters of the State at any place:

a. Floating, suspended, or deposited macroscopic particulate matter or foam;
b. Bottom deposits or aquatic growths to the extent that such deposits or growths cause nuisance or adversely affect beneficial uses;
c. Alteration of temperature, turbidity, or apparent color beyond present natural background levels;

d. Visible, floating, suspended, or deposited oil or other products of petroleum origin; and
e. Toxic or other deleterious substances to be present in concentrations or quantities which will cause deleterious effects on wildlife, waterfowl, or other aquatic biota, or which render any of these unfit for human consumption, either at levels created in the receiving waters or as a result of biological concentration.

2. The discharge of waste shall not cause the following limits to be exceeded in waters of the State at any place within one foot of the water surface:

a. Dissolved Oxygen: 5.0 mg/L, minimum, from June 1 through November 15;
7.0 mg/L, minimum, at all other times of the year

The median dissolved oxygen concentration for any three consecutive months shall not be less than 80% of the dissolved oxygen content at saturation. When natural factors cause concentrations less than that specified above, then the discharge shall not cause further reduction in ambient dissolved oxygen concentrations.

b. Dissolved Sulfide: 0.1 mg/L, maximum

c. pH: Variation from normal ambient pH by more than 0.5 pH units.

d. Un-ionized Ammonia: 0.025 mg/L as N, annual median; and
0.16 mg/L as N, maximum.

e. Nutrients: Waters shall not contain biostimulatory substances in concentrations that promote aquatic growths to the extent that such growths cause nuisance or adversely affect beneficial uses.

3. The discharge shall not cause a violation of any particular water quality standard for receiving waters adopted by the Board or the SWRCB as required by the Clean Water Act and regulations adopted thereunder. If more stringent applicable water quality standards are promulgated or approved pursuant to Section 303 of the Clean Water Act, or amendments thereto, the Board will revise and modify this Order in accordance with such more stringent standards.

D. SLUDGE MANAGEMENT PRACTICES REQUIREMENTS

1. The discharger presently disposes of stabilized, dewatered wastewater solids (sewage sludge) to bou.. municipal solid waste landfill, and by land application to agricultural land.

2. Sludge treatment, storage, and disposal or reuse shall not create a nuisance, such as objectionable odors or flies, or result in groundwater pollution.

3. The treatment and temporary storage of sewage sludge at the Plant shall not cause waste material to be in a position where it will be carried from the sludge treatment or storage site and deposited in the waters of the State.

4. Permanent on-site storage or disposal of sewage sludge at the Plant is not authorized by this Permit.

5. The Board may amend this Permit prior to expiration if changes occur in applicable state and federal sludge regulations.

6. a. Disposal of municipal wastewater solids by land application is regulated by the USEPA under the 40 CFR Part 503 regulations *(Standards for The Use or Disposal of Sewage Sludge;* February 19, 1993 final rule).

b. All the requirements in 40 CFR Part 503 are enforceable by USEPA whether or not they are stated in this Permit or any other permit issued to the discharger.

7. The discharger is required to submit an annual report to the USEPA regarding its sewage sludge disposal practices in accordance with the requirements of 40 CFR Part 503. The discharger shall also submit a copy of this report to the Board.

E. PROVISIONS

1. **Permit Compliance**

The discharger shall comply with the limitations, prohibitions, and other provisions of this Permit immediately upon its adoption by the Board.

2. **Effluent Monitoring Study and Schedule**

The discharger shall conduct a study to evaluate the potential impact of the reclaimed water storage reservoirs on treated effluent discharged through E-001-S per the findings, and in accordance with the following task and time schedule:

Task	Compliance Date
a. Submit a study plan, acceptable to the Executive Officer, to investigate how natural factors, including aquatic plants, wind, and wildlife, may impact water quality in reclaimed water storage reservoirs. At a minimum, the study shall evaluate how these factors impact the quality of water discharged from E-001-S.	January 1, 1999
b. Following approval by the Executive Officer commence work in accordance with the study plan and time schedule submitted pursuant to Task 2.a.	60 days after EO approval
c. Submit final report, acceptable to the Executive Officer, documenting the results of the investigation described in Task 2.a. The report shall include recommended strategies for managing the reservoirs such that their releases minimally impact discharges from E-001-S.	April 1, 2000

3. **Mercury Reduction Study and Schedule**

The discharger shall participate with the Board and other North Bay shallow water dischargers in identifying cross media watershed-wide sources of mercury impacting the receiving waters and in developing potential control measures. The discharger shall also participate in Board development of site specific objectives and/or a wasteload allocation.

Reductions in mercury effluent concentrations should be achieved through source control, pollution prevention, and optimization of treatment plant processes. In addition, the discharger shall evaluate alternate analytical methods that provide lower reporting limits to better evaluate compliance with the 0.012 µg/L objective. This study shall be conducted in accordance with the following tasks and time schedule:

Task	Compliance Date
a. Submit a study plan, acceptable to the Executive Officer, to investigate mercury sources within the collection system, to investigate means to optimize mercury removal by treatment plant processes, to evaluate industrial contributions to mercury loadings and possible means by which these sources can be reduced, and to evaluate alternate analytical methods to provide improved data reporting limits.	December 1, 1998
b. Following approval by the Executive Officer commence work in accordance with the study plan and time schedule submitted pursuant to Task 3.a.	60 days after EO approval
c. Submit an interim report, acceptable to the Executive Officer, documenting the initial findings of the study plan as implemented in Task 3.a. Submittal shall include an action plan for follow-up work necessary to maximize source reductions from potential sources.	November 1, 1999
d. Implement action plan defined in interim report.	January 1, 2000
e. Submit a final report, acceptable to the Executive Officer, documenting findings of source reduction work and efforts made to minimize mercury in the collection system and treated effluent.	April 1, 2001

This permit establishes a water quality based effluent limit of 0.012 µg/L for which compliance will be required within seven years of the effective date of the permit. This limit may be revised in response to site specific objective studies and/or TMDLs to be conducted prior to the final compliance date. If TMDL efforts are delayed by either the USEPA, the Board or the State Board, then the seven-year time compliance schedule will be revised and extended up to an additional three years.

4. **Copper Reduction Study and Schedule**

The discharger shall document current copper reduction and control activities, and evaluate the feasibility of potential enhancements to those activities in accordance with the following tasks and time schedule:

Task	Compliance Date
a. The discharger shall submit a report, acceptable to the Executive Officer, documenting efforts taken to reduce influent copper concentrations, including details of past measures taken by local water agencies to reduce corrosion in the supply system, and the feasibility of further optimization of corrosion control efforts.	June 1, 1999
b. The discharger shall submit a report, acceptable to the Executive Officer, documenting copper and mercury removals across the treatment plant, and evaluating potential measures for further concentration and/or mass loading reductions.	June 1, 1999
c. The discharger shall submit a report, acceptable to the Executive Officer, documenting efforts to identify any other significant copper sources in the community to the wastewater and storm water systems. Assessment of options for source reduction shall be provided for any identified sources.	June 1, 1999

5. **Cyanide Reduction Study and Schedule**

The discharger shall conduct a study to evaluate cyanide removals, possible generation within its treatment process, and analytical interferences per the findings, and in accordance with the following tasks and time schedule:

Tasks	Compliance Date
a. Submit a study plan, acceptable to the Executive Officer, for investigation source control options and treatment options to reduce cyanide concentrations in the treated effluent. The study plan shall include, but not be limited to, a technical analysis of cyanide removals across the Plant, and its potential for generating cyanide.	November 1, 1998
b. Following approval by the Executive Officer commence work in accordance with the study plan and time schedule submitted pursuant to Task 5.a.	60 days after EO approval
c. Submit final report, acceptable to the Executive Officer, documenting the results of the study described in Task 5.a. The report shall include recommendations and an implementation time schedule on feasible source control measures to reduce influent cyanide concentrations, alternate treatment measures to reduce cyanide in treated effluent, and alternate analytical methods to eliminate artifactual results.	March 1, 2000

6. **Receiving Water Study and Schedule**

The discharger shall conduct a receiving water study to assess the appropriateness of beneficial uses attributed to Boynton Slough via the tributary rule. This assessment shall also include an evaluation of fecal and total coliform concentrations and distribution in Boynton Slough and an evaluation of compliance with Basin Plan coliform objectives.

Task	Compliance Date
a. Develop a study plan, acceptable to the Executive Officer, to include, but not be limited to, a receiving water coliform study, and tasks and schedules necessary to assess the beneficial uses attributed to Boynton Slough.	June 1, 1999
b. Following approval by the Executive Officer commence work in accordance with the study plan and time schedule submitted pursuant to Task 6.a.	60 days after EO approval
c. Submit results of the receiving water coliform study and document adverse impacts, if any, on attributed beneficial uses of Boynton Slough by discharging fecal coliform per Effluent Limitation B.3.	January 1, 2001
d. Submit a final report, acceptable to the Executive Officer, documenting the results of the study plan beneficial use investigation described in Task 6.a.	June 1, 2001

7. **Collection System Design Storm Study and Schedule**

The discharger shall conduct a study to evaluate the relative costs versus impacts on receiving water beneficial uses from collection system overflows after a 5-year recurrence interval storm, a 10-year recurrence interval storm, and a 20-year recurrence interval storm, as described in Finding 11b and in accordance with the Basin Plan Maintenance Level Approach. The study shall be conducted in accordance with the following tasks and time schedule:

Task	Compliance Date
a. Develop a study plan, acceptable to the Executive Officer, to evaluate the relative impacts on receiving water beneficial uses from collection system overflows occurring after a 5-year, 10-year, and 20-year recurrence interval storm, and comparative costs of designing new and rehabilitated portions of the main interceptor collection system to contain the 5 and 10 year versus 20 year stormflow.	September 1, 1998
b. Following approval by the Executive Officer commence work in accordance with the study plan and time schedule submitted pursuant to Task 7.a.	60 days after EO approval

c. Submit a final report, acceptable to the Executive Officer, documenting the results of the complete study as described in Task 7.a including recommended design criteria and the results of the cost comparison for providing 5 and 10 year versus 20 year protection.	June 1, 1999

8. **Reclamation Study and Schedule**

The discharger shall conduct a study to maximize the use of reclaimed water. The study must at a minimum include the potential for changing the effluent discharge point from Boynton Slough to Green Valley Creek, landscape irrigation, dust control. The study shall be conducted in accordance with the following tasks and time schedule:

Task	Compliance Date
a. Develop a study plan, acceptable to the Executive Officer, to maximize the use of reclaimed water.	January 1, 1999
b. Following approval by the Executive Officer commence work in accordance with the study plan and time schedule submitted pursuant to Task 8.a.	60 days after EO approval
c. Submit a final report, acceptable to the Executive Officer, documenting the results of the complete study as described in Task 8.a.	August 1, 1999

9. **Disinfectant Study and Schedule**

The discharger shall conduct a study to investigate the feasibility of using alternative disinfectants to replace chlorine. The study shall be conducted in accordance with the following tasks and time schedule:

Task	Compliance Date
b. Following approval by the Executive Officer commence work in accordance with the study plan and time schedule submitted pursuant to Task 9.a.	60 days after EO approval
c. Submit a final report, acceptable to the Executive Officer, documenting the results of the complete study as described in Task 9.a.	September 1, 1999

10. *Contingency Plan.* The discharger's Contingency Plan, as required by Board Resolution 74-10 (attached), shall be reviewed, and updated as necessary, annually. The discharge of pollutants in violation of this Order where the discharger has failed to develop and/or adequately implement a contingency plan will be the basis for considering such discharge a willful and negligent violation of this Order pursuant to Section 13387 of the California Water Code. Annually, the discharger shall submit to the Board a report discussing the status of the Contingency Plan review and update, including a description or copy of any completed revisions, or a statement that no changes are needed.

11. *Operations and Maintenance Manual.* The discharger's Operations and Maintenance Manual shall be reviewed annually, and updated as necessary, and within 90 days of completion of any significant facility or process changes. Annually, the discharger shall submit to the Board a report discussing the status of the O&M Manual review and update, including an estimated time schedule for completion of any revisions determined necessary, a description or copy of any completed revisions, or a statement that no revisions are needed.

12. **Compliance with Discharge Prohibition Exceptions**

The discharger shall ensure compliance with Discharge Prohibition A.2. in accord with the following:

a. Continue to operate the treatment facility to produce the highest quality effluent possible, consistent with good operating practices.

b. Continue to maintain and operate treatment facilities in a manner which maximizes redundancy and reliability of unit processes;

c. Continue to provide high quality effluent on a seasonal basis (typically October through May), to assist in management of the duck club ponds of Suisun Marsh; and

d. Continue to work to use the maximum feasible amount of reclaimed water for irrigation, and to minimize discharges to Boynton Slough during dry weather.

13. **Wet Weather Discharges**

Violations of Prohibitions A.1., A.2., or A.3 of this Order which occur as a result of wet weather flows in excess of a 20-year recurrence interval wet weather event at the Plant, shall be evaluated for potential enforcement actions by the Board on a case by case basis. The Executive Officer will determine what appropriate recurrence interval is necessary following submittal of a report satisfying the requirements of the provisions of this Order.

14. **Compliance with Acute Toxicity Limits (Effluent Limitation B.7. of this Order)**

a. Compliance with the acute toxicity effluent limitation shall be evaluated by measuring survival of test fishes exposed to undiluted effluent for 96 hours in flow-through bioassays. Each fish species represents a single bioassay.

b. Two fish species will be tested concurrently. These shall be the most sensitive species determined from the results of concurrent screening of the following three species: three-spine stickleback, rainbow trout and fathead minnow according to a workplan approved by the Executive Officer. The three species screening requirement can be met using either flow-through or static renewal bioassays, and all tests must be completed within ten days of initiating the first test. If concurrent screenings have previously been conducted, the existing data may be submitted.

c. Based on the results of the concurrent screening, the Executive Officer may consider allowing compliance monitoring with only one fish species (the most sensitive, if known), if the discharger can also document that the acute toxicity limitation has not been exceeded during the previous three years, or that acute toxicity has been observed in only one of two fish species.

d. All bioassays shall be performed according to protocols approved by the USEPA or SWRCB, or published by the American Society for Testing and Materials (ASTM) or American Public Health Association, or as directed in writing by the Executive Officer. The discharger may continue using current test methods until receipt of written guidance from the Executive Officer or SWRCB on conducting the new procedures (described in the findings) and on interpreting compliance results compared with current method test results.

15. **TRE for Chronic Toxicity**

If there is a consistent exceedance of either of the chronic toxicity monitoring triggers, the discharger shall implement a TRE in accordance with a TRE work plan acceptable to the Executive Officer. The TRE work plan shall be submitted to the Executive Officer within 90 days of adoption of this Order. The TRE shall be initiated within 15 days of the date of violation. TREs need to be site specific but should follow USEPA guidance and be conducted in a step-wise fashion. Tier I includes basic data collection, followed by Tier 2 which evaluates optimization of the treatment system operation, facility housekeeping, and the selection and use of in-plant process chemicals.

If unsuccessful in reducing toxicity, Tier 3, a Toxicity Identification Evaluation (TIE) should be initiated and all reasonable efforts using currently available TIE methodologies employed. Assuming successful identification or characterization of the toxicant(s), Tier 4 is to evaluate final effluent treatment options and Tier 5 is to evaluate within plant treatment options. Tier 6 consists of follow-up and confirmation once the toxicity control method has been selected and implemented.

Many recommended TRE elements parallel source control, pollution prevention, and storm water control program best management practices (BMPs). To prevent duplication of effort, evidence of complying with those requirements may be sufficient to comply with TRE requirements if the pollutants targeted by those programs are suspected to be the cause of the chronic toxicity. Support for this may include results of a Phase I TIE or other data as acceptable to the Executive Officer. By requiring the first steps of a TRE to be accelerated testing and review of the facility's TRE workplan, a TRE may be ended in its early stages.

The Board recognizes that identification of causes of chronic toxicity may not be successful in all cases. Consideration of enforcement action by the Board will be based in part on the discharger's actions in identifying and reducing sources of consistent toxicity.

16. **Screening Phase for Chronic Toxicity**

The discharger shall conduct screening phase compliance monitoring as described in the Self-Monitoring Program under either of these two conditions:

a. Subsequent to any significant change in the nature of the effluent discharged through changes in sources or treatment, except those changes resulting from reductions in pollutant concentrations attributable to pretreatment, source control, and waste minimization efforts; or

b. Prior to Permit reissuance, except when the discharger is conducting a TRE/TIE. Screening phase monitoring data shall be included in the application for Permit reissuance. The information shall be as recent as possible, but may be based on screening phase monitoring conducted within five years before the Permit expiration date.

The discharger shall conduct screening phase compliance monitoring in accordance with a proposal submitted to, and acceptable to, the Executive Officer. The proposal shall contain, at a minimum, the elements specified in Part B of the Self-Monitoring Program of this Order, or alternatives as approved by the Executive Officer. The purpose of the screening is to determine the most sensitive test species for subsequent routine compliance monitoring for chronic toxicity.

17. **Mass Emission Limit**

The discharger shall not exceed a mass emission limit for mercury of 0.060 kg/month. The mass emission shall be calculated as follows:

Flow = Running average of last 12 months of effluent flow in mgd, measured at E-001-S

Hg Conc = Running average of last 12 monthly mercury concentration measurements in µg/L, measured at E-001-A

Mass emission, in kg/month = Flow x Hg Conc x 0.1151

18. **Mass Emission Loading Reduction**

If mass loading for Hg exceeds the trigger level specified in B.9 of this Order, then the following actions shall be initiated and subsequent reports shall include but not be limited to the following:

I. Notification: Any exceedance of the trigger specified in Effluent Limitation B.9 shall be reported to the Board in accordance with section E.6.b in the Standard Provisions and Reporting Requirements (August, 1993).
II. Identification of the problem: Resample to verify the increase in loading. If resampling confirms that the mass loading trigger has been exceeded, determine whether the exceedance is flow or concentration-related. If the exceedance is flow related, identify whether it related to changes in reclamation, increase in the number of sewer connections, increases in infiltration and inflow (I/I), wet weather conditions, or unknown sources. If the exceedance is concentration-related, identify whether it is related to industrial, commercial, residential, or unknown sources.

III. Investigation of corrective action: • **Investigate the feasibility of the following actions:Improving public education and outreach** • **Reducing inflow and infiltration (I/I)** • **Increasing reclamation** • **Develop a plan and time schedule, acceptable to the Executive Officer to implement all reasonable actions to maintain mercury mass loadings at or below the mass loading trigger contained in Effluent Limitation B.9.**
IV. Investigation of additional prevention measures: In the event the exceedance is related to growth and the plan required under III is not expected to keep mercury loads below the mass load trigger, work with the local planning department to investigate the feasibility and potential benefits of requiring water conservation, reclamation, and dual plumbing for new development.

19. **Pretreatment Program**

The discharger shall implement and enforce its approved pretreatment program in accordance with Federal pretreatment regulations (40 CFR Part 403), pretreatment standards promulgated under Sections 307(b), 307(c) and 307(d) of the Clean Water Act, and this Board's Order No. 95-015 with all amendments and revisions thereafter. The discharger's responsibilities include but are not limited to:

a. Enforcement of National Pretreatment Standards of 40 CFR 403.5 and 403.6;
b. Implementation of its pretreatment program in accordance with legal authorities, policies, procedures, and financial provisions described in the General Pretreatment regulations (40 CFR Part 403) and its approved pretreatment program;
c. Submission of annual and semi-annual reports to USEPA and the State as described in Board Order No. 95-015 and its amendments or revisions thereafter.

The discharger shall implement its approved pretreatment program and the program shall be an enforceable condition of this permit. If the discharger fails to perform the pretreatment functions, the Regional Water Quality Control Board (RWQCB), the State Water Resources Control Board (SWRCB) or U.S. Environmental Protection Agency (USEPA) may take enforcement actions against the discharger as authorized by the Clean Water Act.

Pollution Prevention Program

a. The discharger shall continue to participate in the Pollution Prevention Program (previously known as Waste Minimization Program) as described in Chapter IV of the Basin Plan under "Pollution Prevention."

b. The discharger shall continue to implement and expand its Pollution Prevention Program in order to reduce pollutant loadings to the Plant and, subsequently, to receiving waters.

c. Annually, the discharger shall submit to the Board a Pollution Prevention Annual Report and a Midyear Progress Report, by January 31 and July 31 respectively, that are acceptable to the Executive Officer. These reports should include the following:

(1) Documentation of the discharger's efforts and progress;
(2) Evaluation of the program's accomplishments; and
(3) Identification of specific tasks and associated time schedules for future efforts.

20. *Wastewater Facilities Evaluation.* The discharger shall regularly review and evaluate its wastewater collection, treatment and disposal facilities in order to ensure that all facilities are adequately staffed, supervised, financed, operated, maintained, repaired, and upgraded as necessary, in order to provide adequate and reliable transport, treatment, and disposal of all wastewater from both existing and planned future wastewater sources under the discharger's service responsibilities. A summary of the results of this review and evaluation shall be submitted to the Board annually.

21. *Self-Monitoring Program.* The discharger shall comply with the Self-Monitoring Program for this Order (attached), as adopted by the Board, and as may be amended by the Executive Officer.

22. *Regional Study.* The discharger shall participate in a regional study to identify analytical methods with lower detection limits for PAHs, PCBs, pesticides, and dioxins. The purpose of this work is to establish the pollutant levels in the effluent using ultra-clean sampling procedures and low-level analytical procedures. To the extent non-EPA approved (40CFR136) methods are used, the results will not be used for compliance purposes.

23. *Standard Provisions.* The discharger shall comply with all applicable items of the "Standard Provisions and Reporting Requirements for NPDES Surface Water Discharge Permits" dated August 1993 (attached), or any amendments thereafter.

24. **Change in Control or Ownership**

a. In the event of any change in control or ownership of land or waste discharge facilities presently owned or controlled by the discharger, the discharger shall notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be immediately forwarded to the Board.

b. To assume operation of this Order, the succeeding owner or operator must apply in writing to the Executive Officer requesting transfer of the Order (see Standard Provisions, referenced above). The request must contain the requesting entity's full legal name, the address and telephone number of the persons responsible for contact with the Board and a statement. The statement shall comply with the signatory paragraph described in Standard Provisions and state that the new owner or operator assumes full responsibility for compliance with this Order. Failure to submit the request shall be considered a discharge without requirements, a violation of the California Water Code.

25. *Reopener.* The Board may modify, or revoke and reissue, this Order and Permit if present or future investigations demonstrate that the discharge(s) governed by this Order will cause, have the potential to cause, or will contribute to adverse impacts on water quality and/or beneficial uses of the receiving waters. The Board may reopen this Permit within five years of adoption to review results of the discharger's and Board staff's mercury studies and decide whether a final limit or revised interim limit/revised compliance schedule should be added.

26. *NPDES Permit.* This Order shall serve as a National Pollutant Discharge Elimination System (NPDES) permit pursuant to Section 402 of the Clean Water Act or amendments thereto, and shall become effective 10 days after the date of its adoption provided the USEPA Regional Administrator has no objection. If the Regional Administrator objects to its issuance, the permit shall not become effective until such objection is withdrawn.

27. **Rescission of Previous Order**

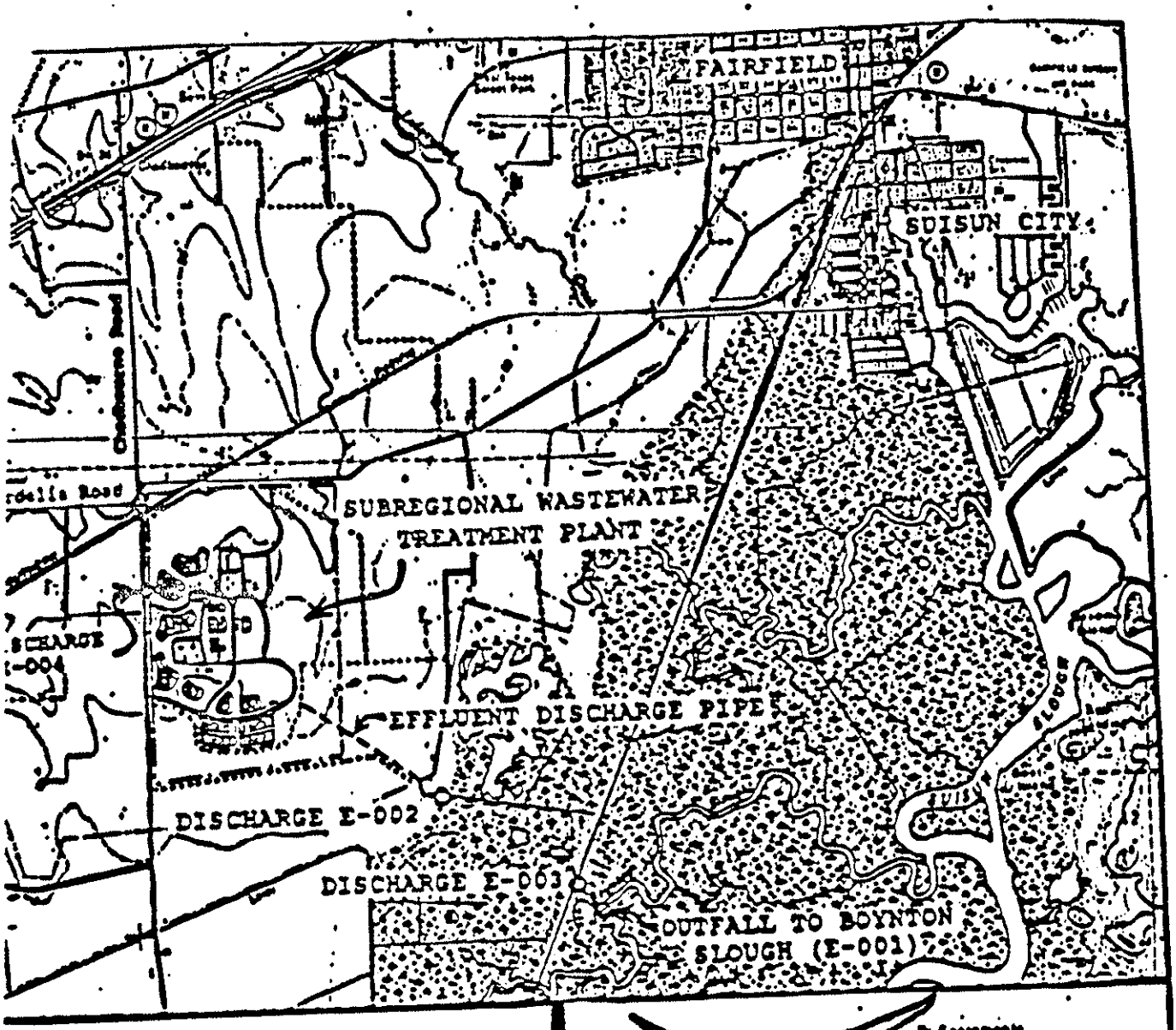
Requirements prescribed by this Order supersede the requirements prescribed by Order No. 90-101. Order No. 90-101 is hereby rescinded.

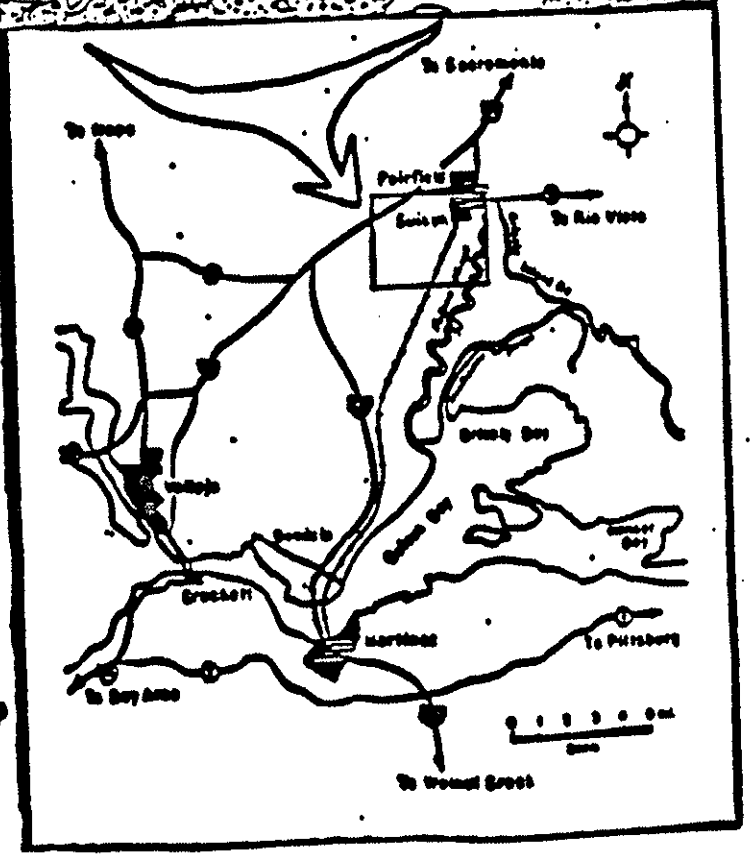
28. *Order Expiration.* This Order expires on July 15, 2003. The discharger must file a report of waste discharge in accordance with Title 23, Chapter 3, Subchapter 9 of the California Administrative Code not later than 180 days before this expiration date as application for reissuance of waste discharge requirements.

I, Loretta K. Barsamian, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on July 15, 1998.

for Loretta K. Barsamian
Executive Officer

Attachments:
Plant and Discharge Location Map
Treatment Process Schematic Diagram
Self-Monitoring Program
Attachment A - Definition of NOEL
Attachment B - Chronic Toxicity Screening Phase Monitoring Requirements
Attachment C - Definition of Terms for Chemical Constituents
Standard Provisions and Reporting Requirements, August 1993
Board Resolution No. 74-10

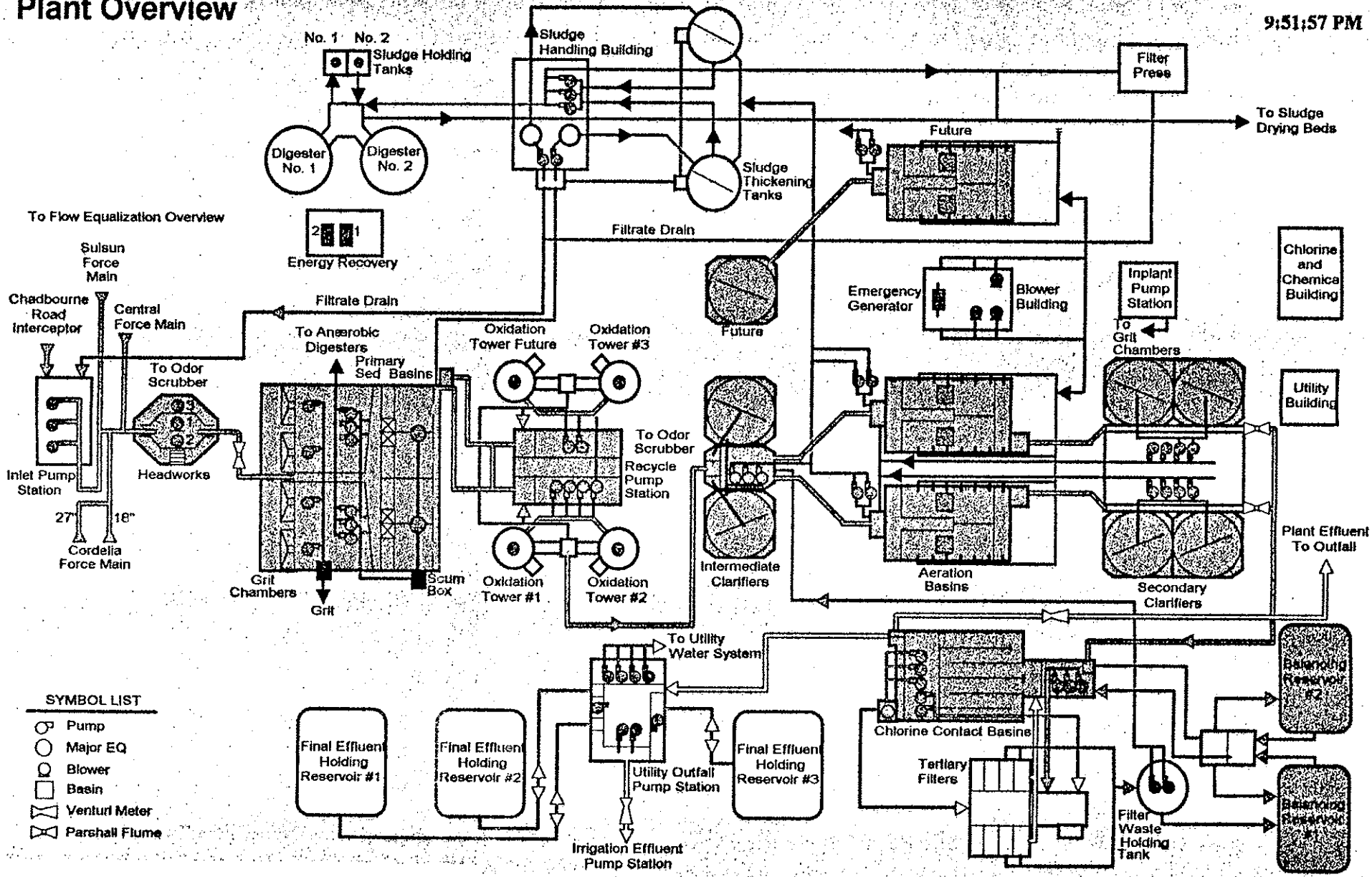




FSSD NPDES Permit

Fairfield Suisun Sewer District
Treatment Plant and Discharge Location Map

Plant Overview



CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

SELF-MONITORING PROGRAM

FOR

FAIRFIELD-SUISUN SEWER DISTRICT
FAIRFIELD- SUISUN SUBREGIONAL
WASTEWATER TREATMENT PLANT

FAIRFIELD, SOLANO COUNTY

NPDES PERMIT NO. CA0038024

ORDER NO. 98-077

CONSISTS OF

PART A (dated August 1993)

AND

PART B

SELF-MONITORING PROGRAM
PART B

I. DESCRIPTION OF SAMPLING STATIONS

A. INFLUENT

Station	Description
A-001	At any point in the treatment facilities headworks at which all waste tributary to the treatment system is present, and preceding any phase of treatment.

B. EFFLUENT

Station	Description
E-001-A	Treatment Plant Effluent At a point in the treatment facility, at which point all treated wastewater processed by the plant is present.
E-001-D	Disinfected Effluent At a point in the treatment facility, at which point adequate contact with the disinfectant is assured. (May be the same as E-001-A.)
E-001-S	Effluent to Boynton Slough Outfall At a point in the treatment facility, at which point all waste tributary to this discharge is present, prior to the point of discharge.
E-002	Duck Club Turnout No. 1.
E-003	Duck Club Turnout No. 2.
E-004	Effluent to Irrigation Reuse At a point in the treatment facility, at which point all treated wastewater to be discharged through reuse for irrigation is present.

NOTE: Total Plant Effluent (E-001-A) flow is split into separate flows to Boynton Slough (E-001-S) and to Irrigation Reuse (E-004).

C. RECEIVING WATERS

Station	Description
C-1 (S11F)	At a point in Boynton Slough about 100 feet downstream (i.e., towards Suisun Slough) from the discharge outfall.
C-2 (S11R)	At a point in Boynton Slough about 100 feet downstream from where the Southern Pacific Railroad tracks cross over the slough.
C-3	At a point in Boynton Slough located about 1800 feet downstream from the discharge outfall, as shown on the attached *Location Map-Receiving Water Monitoring Stations*.
C-4 (S11)	At a point in the mouth of Boynton Slough as it enters Suisun Slough.
C-5 (S45A)	At a point in the mouth of Sheldrake Slough as it enters Suisun Slough.
C-6 (S3)	At a point in the mouth of Peytonia Slough as it enters Suisun Slough.
C-R-1 (S3R)	At a point in Peytonia Slough about 100 feet downstream from where the Southern Pacific Railroad tracks cross over the slough.
C-R-2	At a point in Chadbourne Slough about 100 feet downstream from where the Southern Pacific Railroad tracks cross over the slough.

NOTE: "S" codes shown in parentheses are references to equivalent monitoring stations used in Bureau of Reclamation monitoring (1977-1981) published as: "Suisun Marsh Management Study, Water Quality Observations on the Effects of Wastewater Discharge to Duck Clubs and Sloughs in the Suisun Marsh," by the U.S. Dept. of Interior, Bureau of Reclamation, August 1985.

D. TREATMENT PLANT PERIMETER (Land Observations)

Station	Description
P-1, to P-8	Points located at the corners and at midpoints along the perimeter (fence line) of the wastewater treatment facilities.

NOTE: A drawing showing the locations of these stations shall be included in the Annual Report, and in the monthly report if stations change.

E. OVERFLOWS

Station	Description
O	At points in the collection system, such as pump stations and manholes, where overflows occur.

II. SCHEDULE OF SAMPLING, ANALYSIS AND OBSERVATION

The schedule of sampling, analysis and observation shall be that given in Table 1.

III. MODIFICATION OF PART A (August 1993)

A. This monitoring program does not include the following sections of Part A:

C.2.d.; C.2.f.; D.4.; and E.3.

B. This monitoring program includes the following modifications of Part A:

1. Section F.5., Annual Reporting: The first sentence is revised to read:

'The discharger shall submit to the Board an Annual Report for each calendar year, to be received no later than February 15 of the following year.'

IV. REPORTING REQUIREMENTS

A. General Reporting Requirements are described in Section E of the Board's "Standard Prc ions and Reporting Requirements for NPDES Surface Water Discharge Permits", dated August 1993.

B. A Self-Monitoring Report shall be submitted for each calendar month. The report shall be submitted to the Board by the last day of the following month. The required contents of these reports are described in SMP Part A, Section F.4.

C. An Annual Report shall be submitted for each calendar year. The report shall be submitted to the Board by February 15 of the following year. The required contents of these reports are described in SMP Part A, Section F.5.

D. Any overflow, bypass or significant non-compliance incident that may endanger health or the environment shall be reported in accordance with SMP Part A, Sections F.1 and F.2, and any additional reporting guidance as may be provided by Board staff. The date, time, duration, location, estimated volume of wastewater discharged, and corrective actions taken for these events shall be reported in the monthly Self-Monitoring Reports.

E. Flow Monitoring and Reporting.

a. Influent and Effluent (A-001, E-001-A, E-001-S, and E-004):
Flows shall be measured continuously, and recorded and reported daily. The following information shall also be reported, for each calendar month: Average, Maximum and Minimum Daily Flows (mgd).

b. Influent (A-001):
The following information shall also be reported, on a daily basis:
Maximum and minimum flow rates, and times of occurrence.

c. Effluent to Duck Club Ponds (E-002 & E-003):
Record and report Total Monthly Flow (MG).

F. BOD and TSS Percent Removal.
Percent removal for BOD and TSS shall be reported for each calendar month, in accordance with Effluent Limitation B.2.

V. CHRONIC TOXICITY MONITORING REQUIREMENTS

A. Test Species and Frequency: The discharger shall collect 24-hour composite samples at E-001-S on consecutive days for critical life stage toxicity testing as indicated below:

Test Species	Frequency
Selenastrum capricornutum	quarterly

After at least twelve test rounds, the discharger may request the Executive Officer to decrease the required frequency of testing, and/or to reduce the number of compliance species to [illegible]. Such a request may be made only if toxicity exceeding the TUc values specified in the effluent limitations was never observed using that test species.

B. Conditions for Accelerated Monitoring: The discharger shall accelerate the frequency of monitoring to bimonthly (every two months), or as otherwise specified by the Executive Officer, after exceeding a three sample median value of 1 TUc or a single sample maximum of 2 TUc.

C. Methodology: Sample collection, handling and preservation shall be in accordance with USEPA protocols. The test methodology used shall be in accordance with the references cited in the Permit, or as approved by the Executive Officer. A concurrent reference toxicant test shall be performed for each test.

D. Dilution Series: The discharger shall conduct tests at 100%, 50%, 10%, 5%, and 2.5%. The "%" represents percent effluent as discharged. The 100% dilution may be omitted if the marine test species specified is sensitive to artificial sea salts.

VI. CHRONIC TOXICITY REPORTING REQUIREMENTS

A. Routine Reporting: Toxicity test results for the current reporting period shall include the following, at a minimum, for each test:

a. Sample date(s)
b. Test initiation date
c. Test species
d. End point values for each dilution (e.g., number of young, growth rate, percent survival)
e. NOEC value(s) in percent effluent
f. IC_{15}, IC_{25}, IC_{40}, and IC_{50} values (or EC_{15}, EC_{25} ... etc.) in percent effluent
g. TUc values (100/NOEC, $100/IC_{25}$, and $100/EC_{25}$)
h. Mean percent mortality ($\pm$ s.d.) after 96 hours in 100% effluent
i. NOEC and LOEC values for reference toxicant test(s)
j. IC_{50} or EC_{50} value(s) for reference toxicant test(s)
k. Available water quality measurements for each test (i.e., pH, D.O., temperature, conductivity, hardness, salinity, ammonia)

B. Compliance Summary: Each self-monitoring report shall include a summary table of chronic toxicity data of, at a minimum, samples collected during the most recent year.

C. Reporting Raw Data in Electronic Format: On a semi-annual basis, by February 15 and August 15 of each year, the discharger shall report all chronic toxicity data for the previous semi-annual report in the format specified in "Suggested Standardized Reporting Requirements for Monitoring Chronic Toxicity," August 1993, SWRCB. The data shall be submitted in either high or low density, double 3.5-inch floppy diskettes.

VII. MISCELLANEOUS REPORTING

A. The discharger shall retain and submit (when required by the Executive Officer) the following information concerning the monitoring program for organic and metallic pollutants.

a. Description of sample stations, times, and procedures.

b. Description of sample containers, storage, and holding time prior to analysis.

c. Quality assurance procedures together with any test results for replicate samples, sample blanks, and any quality assurance tests, and the recovery percentages for the internal surrogate standard.

B. The discharger shall submit in the monthly self-monitoring report the metallic and organic test results together with the detection limits (including unidentified peaks). All unidentified (non-

Priority Pollutant) peaks detected in the USEPA 624, 625 test methods shall be identified and semi-quantified. Hydrocarbons detected at <10 μg/L based on the nearest internal standard may be appropriately grouped and identified together as aliphatic, aromatic and unsaturated hydrocarbons. All other hydrocarbons detected at > 10 μg/L based on the nearest internal standard shall be identified and semi-quantified.

I, Loretta K. Barsamian, Executive Officer, hereby certify that the foregoing Self-Monitoring Program:

1. Has been developed in accordance with the procedure set forth in this Board's Resolution No. 73-16 in order to obtain data and document compliance with waste discharge requirements established in Board Order No. 98 -077.

2. May be reviewed at any time subsequent to the effective date upon written notice from the Executive Officer or request from the discharger, and revisions will be ordered by the Executive Officer.

3. Is effective as of July 15, 1998.

for LORETTA K. BARSAMIAN
Executive Officer

Attachments:
Table 1 - Schedule for Sampling, Measurements and Analyses
Footnotes for Table 1
Table 2 - Listed Pollutants
Location Map, Receiving Water Monitoring Stations

TABLE 1

SCHEDULE OF SAMPLING, MEASUREMENT, AND ANALYSIS

Station	Constituent	Unit	Type of Sample	Frequency of Analysis
A-001	Flow Rate [1]	mgd	Continuous	Continuous
	BOD5, 20oC [2]	mg/L	24 hr composite	3 times/week
	TSS	mg/L	24 hr composite	3 times/week
E-001-A	Flow Rate [1]	mgd	Continuous	Continuous
	BOD5, 20oC [2]	mg/L	24 hr composite	3 times/week
	TSS [2]	mg/L	24 hr composite	3 times/week
	Oil & Grease [3,4]	mg/L & kg/d	24 hr composite	Monthly
	Settleable Matter	mL/L-hr	24 hr composite	Daily
	Chlorine Residual [5]	mg/L	Continuous	Continuous
	Total Coliform [6]	MPN/100 mL	Grab	Daily
	Turbidity	NTU	24 hr composite	Daily
	pH	Std Units	Grab	Daily
	Temperature	oF	Grab	Daily
	Dissolved Oxygen	mg/L and % saturation	Grab	Daily
	Total Sulfides [7]	mg/L	Grab	Daily
	Arsenic [8]	µg/L & kg/d	24 hr composite	Quarterly
	Cadmium	µg/L & kg/d	24 hr composite	Quarterly
	Chromium Total or Hexavalent	µg/L & kg/d	24 hr composite	Quarterly
	Copper	µg/L & kg/d	24 hr composite	Monthly
	Cyanide [9]	µg/L & kg/d	24 hr composite	Monthly
	Lead	µg/L & kg/d	24 hr composite	Monthly
	Mercury	µg/L & kg/month	24 hr composite	Monthly
	Nickel	µg/L & kg/d	24 hr composite	Monthly
	Silver	µg/L & kg/d	24 hr composite	Quarterly
	Selenium	µg/L & kg/d	24 hr composite	Twice/year
	Zinc	µg/L & kg/d	24 hr composite	Monthly
	Phenols [10]	µg/L	Grab	Twice/year
	PAH=s [11] [21]	µg/L	Grab	Twice/year
	Listed Pollutants [12]	µg/L	Grab	Twice/year
	USEPA 608 [13] [21]	µg/L	Grab	Twice/year

	USEPA 624 [14]	μg/L	Grab	Twice/year
	USEPA 625 [14]	μg/L	Grab	Twice/year
	USEPA 1613 [15] [21]	pg/L	Grab	Twice/year
	Nitrogens (as N) [16]	mg/L	24 hr composite	Weekly
	Total Phosphate	mg/L	24 hr composite	Weekly
	Standard Observations		Visual	Weekly
Station	Constituent	Unit	Type of Sample	Frequency of Analysis
E-001-S	Flow Rate [1]	mgd	Continuous	Continuous
	Acute Toxicity [17]	Survival	24 hr composite	Monthly
	Chronic Toxicity [18]		24 hr composite	Quarterly/Weekly
	Chlorine Residual [5]	mg/L	Continuous	Continuous
	pH [19]	Std Units	Continuous	Continuous
	Temperature	oF	Continuous	Continuous
	Dissolved Oxygen	mg/L and % saturation	Grab	Daily
	Total Sulfides [7]	mg/L	Grab	Daily
E-002 & E-003	Flow Rate [1]	mgd	Reading	Each Occurrence
E-004	Flow Rate [1]	mgd	Continuous	Continuous
All C	Turbidity	NTU	Grab	[20]
StationspH		Std Units	Grab	[20]
	Temperature	oF	Grab	[20]
	Dissolved Oxygen	mg/L	Grab	[20]
	Nitrogens (as N) [16]	mg/L	Grab	[20]
	Total Phosphate	mg/L	Grab	[20]
	Conductivity	μmhos	Grab	[20]
	Hardness (as CaCO3)	mg/L	Grab	[20]
	Salinity	ppt	Grab	[20]
	Chloryphyll-a	mg/L	Grab	[20]
	Secchi Disk	inches	Grab	[20]
	Water Depth	feet	Grab	[20]
	Standard Observations		Visual	[20]

Footnotes for Table 1:

1. Flows shall be monitored continuously and the following shall be reported in monthly self-monitoring reports.:

a. Influent, average daily flow (A-001);
b. Influent, maximum and minimum flow rates and times of occurrence (A-001);
c. Effluent, daily flow (E-001-A);
d. Effluent , daily flow to Boynton Slough outfall (E-001-S);
e. Effluent, daily flow to Irrigation (E-004);
f. Effluent, flow distributed to duck club ponds (seasonal, E-002 & E-003). May be reported as monthly totals (in MG).

2. The percent removal for BOD and TSS shall be reported for each calendar month, in accordance with Effluent Limitation B.2.

3. Oil and grease sampling shall consist of three grab samples taken at two hour intervals during the sampling day, with each grab being collected in a glass container. The entire volume of each sample shall be composited prior to analysis. Each glass container used for sample collection or mixing shall be thoroughly rinsed with solvent rinsings as soon as possible after use, and the solvent rinsings shall be added to the composite wastewater sample for extraction and analysis.

4. Grab samples shall be collected coincident with samples collected for the analysis of regulated parameters. In addition, the grab samples must be collected in glass containers. Polycarbonate containers may be used to store tributyltin samples.

5. Chlorine residual concentrations shall be monitored and reported for sampling points both prior to and following dechlorination. Total chlorine dosage (kg/day) shall be recorded on a daily basis.

6. When replicate analyses are made of a coliform sample, the reported result shall be the arithmetic mean of the replicate analysis sample.

7. Sulfide analysis shall be run when dissolved oxygen concentrations fall below 2.0 mg/L.

8. Arsenic must be analyzed for by the atomic absorption, gaseous hydride procedure (USEPA method No. 206.3/Standard Method No. 303E). Alternative methods of analysis must be approved by the Executive Officer.

9. The discharger may, at its option, analyze for cyanide as Weak Acid Dissociable (WAD) Cyanide using protocols specified in Standard Method No. 4500-CN-I, latest edition.

10. Selenium must be analyzed for only by the atomic absorption, gaseous hydride procedure (USEPA method No. 270.3/Standard Method No. 303E). Alternative methods of analysis must be approved by the Executive Officer.

11. Polynuclear aromatic hydrocarbons, PAHs, shall be analyzed using the latest version of USEPA

Method 610 (8100 or 8300). The discharger shall attempt to achieve the lowest detection limits commercially available. If an analysis cannot achieve a quantification limit for a particular sample at or below the effluent limits for PAHs, the discharger shall provide an explanation in its self-monitoring report. Note that the samples must be collected in amber glass containers. These samples shall be collected for the analysis of the regulated parameters. An automatic sampler which incorporates glass sample containers, and keeps the samples refrigerated at 4oC, and protected from light during compositing may be used. The 24-hour composite samples may consist of eight grab samples collected at three hour intervals. The analytical laboratory shall remove flow proportioned volumes from each sample vial or container for the analysis.

For PAHs, the existing limit in the Basin Plan is defined as the sum of sixteen constituents measured in USEPA Method 610. More current data from the NTR lists standards for just eleven of the PAHs measured in Method 610. The USEPA criteria for three of the eleven are higher than the other eight; these are anthracene (NTR objective at 110,000 ppb), fluorene (14,000 ppb), and pyrene (11,000 ppb). Therefore, the PAHs of concern permit are the eight PAHs that may be present in the discharge at concentrations which pose a reasonable potential to contribute to water quality impacts. The USEPA criteria for each of these eight PAHs are 0.049 ppb based on updated cancer potency factors (q*) from USEPA's Integrated Risk Information System (IRIS). Although three of these eight PAHs have been detected in the discharger's effluent in the past 5 years, because the current detection limits for PAHs are greater than the 0.049 ppb criteria, the 0.049 ppb for the eight PAHs are designated as effluent goals rather than effluent limitations. [USEPA human health criteria calculations from the TSD, with updated cancer potencies (q*) and reference doses (RfD) from the California Office of Environmental Health Hazard Assessment, and in USEPA's Integrated Risk Information System (IRIS). Calculations based on average human body weight of 70 kg, USEPA estimated national average fish consumption of 6.5 g/d, and a 10-6 cancer risk level for carcinogens.]

12. This includes all of the listed constituents given in SMP Part B Table 2.

13. The discharger shall attempt to achieve the lowest detection limits commercially available using the latest versions of USEPA Methods 608 (or 8080).

14. The latest versions of USEPA Methods 624 (or 8240), and 625 (or 8270) shall be used.

15. The latest version of USEPA Method 1613 shall be used to determine TCDD Equivalents, and the discharger shall attempt to achieve the lowest detection limits commercially available. Analysis results at or below the quantification limits listed below may be considered zero for use in the calculations for compliance determination with the TCDD Equivalents limit.

Isomer Group	Quantification Limit
2,3,7,8-tetra CDD	5 pg/L
2,3,7,8-penta CDD	5 pg/L
2,3,7,8-hexa CDDs	10 pg/L

2,3,7,8-hepta CDD	10 pg/L
octa CDD	25 pg/L
2,3,7,8-tetra CDF	5 pg/L
1,2,3,7,8-penta CDF	5 pg/L
2,3,4,7,8-penta CDF	5 pg/L
2,3,7,8-hexa CDFs	10 pg/L
2,3,7,8-hepta CDFs	10 pg/L
octa CDF	25 pg/L

If the analysis performed cannot achieve the quantification limits specified above, the discharger shall provide an explanation in its self-monitoring report. Another sample shall be analyzed if the reported quantification limits are significantly above the limits specified above.

16. Ammonia (as N) shall be measured as Total Ammonia; the unionized fraction shall be calculated based on the total ammonia, pH , total dissolved solids or salinity, and temperature.

17. Flow-through bioassays shall be conducted with the two of the most sensitive fish species determined from concurrent screenings of three-spine stickleback, rainbow trout and fathead minnow pursuant to Provision E.12. of this Order. The Executive Officer may allow compliance monitoring with only one fish specie (the most sensitive, if known) provided that the discharger conducts sufficient screening with rainbow trout. The following constituents shall be measured on a daily basis, and reported for the bioassay sample stream: pH, Temperature, and Dissolved Oxygen (Sulfides if D.O. falls below 2.0 mg/L).

18. Critical Life Stage Toxicity Test shall be performed and reported in accordance with the Chronic Toxicity Requirements specified in Sections V and VI of the Self-Monitoring Program contained in this Order.

19. Monitoring for pH shall be done continuously; the minimum and maximum pH values for each day shall be reported in monthly self-monitoring reports.

20. Stations CR-1, CR-2, C-1, C-2, C-3, C-4, C-5 and C-6 shall be monitored monthly, and on the same day.

21. The discharge shall conduct low-level monitoring with ultra-clean procedures for PAHs. PCBs, pesticides, and dioxins. The discharger shall utilize 3-5 laboratories and determine the reproducibility of results over a two-year period conducting sampling on a semi-annual basis. The purpose of this work is to establish the pollutant levels in the effluent using ultra-clean sampling procedures and low-level analytical procedures. To the extent that non-EPA approved (40CFR136) methods are used, the results will not be used for compliance purposes.

ATTACHMENT A

CHRONIC TOXICITY - DEFINITION OF TERMS

A. No observed effect level (NOEL) for compliance determination is equal to IC25 or EC25. If the IC25 or EC25 cannot be statistically determined, the NOEL shall be equal to the NOEC derived using hypothesis testing.

B. Effective concentration (EC) is a point estimate of the toxicant concentration that would cause an adverse effect on a quantal, "all or nothing," response (such as death, immobilization, or serious incapacitation) in a given percent of the test organisms. If the effect is death or immobility, the term lethal concentration (LC) may be used. EC values may be calculated using point estimation techniques such as probit, logit, and Spearman-Karber. EC25 is the concentration of toxicant (in percent effluent) that causes a response in 25% of the test organisms.

C. Inhibition Concentration (IC) is a point estimate of the toxicant concentration that would cause a given percent reduction in a non-lethal, non-quantal biological measurement, such as growth. For example, an IC25 is the estimated concentration of toxicant that would cause a 25% reduction in average young per female or growth. IC values may be calculated using a linear interpolation method such as EPA's Bootstrap Procedure.

D. No observed effect concentration (NOEC) is the highest tested concentration of an effluent or a toxicant at which no adverse effects are observed on the aquatic test organisms at a specific time of observation. It is determined using hypothesis testing.

ATTACHMENT B

CHRONIC TOXICITY - SCREENING PHASE REQUIREMENTS

A. The discharger shall perform screening phase monitoring:

1. Subsequent to any significant change in the nature of the effluent discharged through changes in sources or treatment, except those changes resulting from reductions in pollutant concentrations attributable to pretreatment, source control, and waste minimization efforts, or

2. Prior to Permit reissuance. Screening phase monitoring data shall be included in the NPDES Permit application for reissuance. The information shall be as recent as possible, but may be based on screening phase monitoring conducted within 5 years before the permit expiration date.

B. Design of the screening phase shall, at a minimum, consist of the following elements:

1. Use of test species specified in Tables 1 and 2 (attached), and use of the protocols referenced in those tables, or as approved by the Executive Officer;

2. Two stages:

   a. Stage 1 shall consist of a minimum of one battery of tests conducted concurrently. Selection of the type of test species and minimum number of tests shall be based on Table 3 (attached); and

   b. Stage 2 shall consist of a minimum of two test batteries conducted at a monthly frequency using the three most sensitive species based on the Stage 1 test results and as approved by the Executive Officer.

3. Appropriate controls; and

4. Concurrent reference toxicant tests.

CHRONIC TOXICITY

TABLE B-1

CRITICAL LIFE STAGE TOXICITY TESTS FOR ESTUARINE WATERS

SPECIES	EFFECT	TEST DURATION	REFERENCE
alga (Skeletonema costatum) (Thalassiosira pseudonana)	growth rate	4 days	1
red alga (Champia parvula)	number of cystocarps	7-9 days	3
giant kelp (Macrocystis pyrifera)	percent germination; germ tube length	48 hours	2
abalone (Haliotis rufescens)	abnormal shell development	48 hours	2
oyster (Crassostrea gigas) mussel (Mytilus edulis)	abnormal shell development; percent survival	48 hours	2
Echinoderms (urchins - Strongylocentrotus purpuratus); (sand dollar - Dendraster excentricus)	percent fertilization	1 hour	2
shrimp (Mysidopsis bahia)	percent survival; growth	7 days	3
shrimp (Holmesimysis costata)	percent survival; growth	7 days	2
Topsmelt (Atherinops affinis)	percent survival; growth	7 days	2
silversides (Menidia beryllina)	larval growth rate; percent survival	7 days	3

TOXICITY TEST REFERENCES

1. American Society for Testing Materials (ASTM). 1990. Standard Guide for conducting static 96-hour toxicity tests with microalgae. Procedure E 1218-90. ASTM, Philadelphia, PA.

2. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms. EPA/600/R-95/136. August 1995

3. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms. EPA-600/4-90/003. July 1994

TABLE B-2
CRITICAL LIFE STAGE TOXICITY TESTS FOR FRESH WATERS

SPECIES	EFFECT	TEST DURATION	REFERENCE
fathead minnow (Pimephales promelas)	survival; growth rate	7 days	4
water flea (Ceriodaphnia dubia)	survival; number of young	7 days	4
alga (Selenastrum capricornutum)	cell division rate	4 days	4

TOXICITY TEST REFERENCE

4. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms. Third edition. EPA/600/4-91/002. July 1994

TABLE B-3
TOXICITY TEST REQUIREMENTS FOR STAGE ONE SCREENING PHASE

REQUIREMENTS	RECEIVING WATER CHARACTERISTICS		
	DISCHARGES TO COAST	DISCHARGES TO SAN FRANCISCO BAY[1]	
	Ocean	Marine	Freshwater
Taxonomic Diversity	1 plant 1 invertebrate 1 fish	1 plant 1 invertebrate 1 fish	1 plant 1 invertebrate 1 fish
Number of tests of each salinity type:			
Freshwater[2]	0	1 or 2	3
Marine	4	3 or 4	0
Total number of tests	4	5	3

[1] Marine refers to receiving water salinities greater than 5 ppt at least 75% of the time during a normal water year.
Fresh refers to receiving water with salinities less than 5 ppt at least 75% of the time during a normal water year.

[2] The fresh water species may be substituted with marine species if:

1) the salinity of the effluent is above 5 parts per thousand (ppt) greater than 75% of the time, or

2) the ionic strength (TDS or conductivity) of the effluent at the test concentration used to determine compliance is documented to be toxic to the test species.